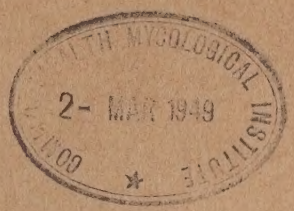
N.S.W. DEPARTMENT OF AGRICULTURE

BIOLOGICAL BRANCH - DIVISION OF SCIENCE SERVICES




# PLANT DISEASE SURVEY

for the

TWELVE MONTH PERIOD ENDING 30TH JUNE, 1948.

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## EIGHTEENTH ANNUAL REPORT

Notes compiled by officers of the Plant Pathological Section of the Biological Branch, New South Wales, Department of Agriculture.

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N.S.W. DEPARTMENT OF AGRICULTURE

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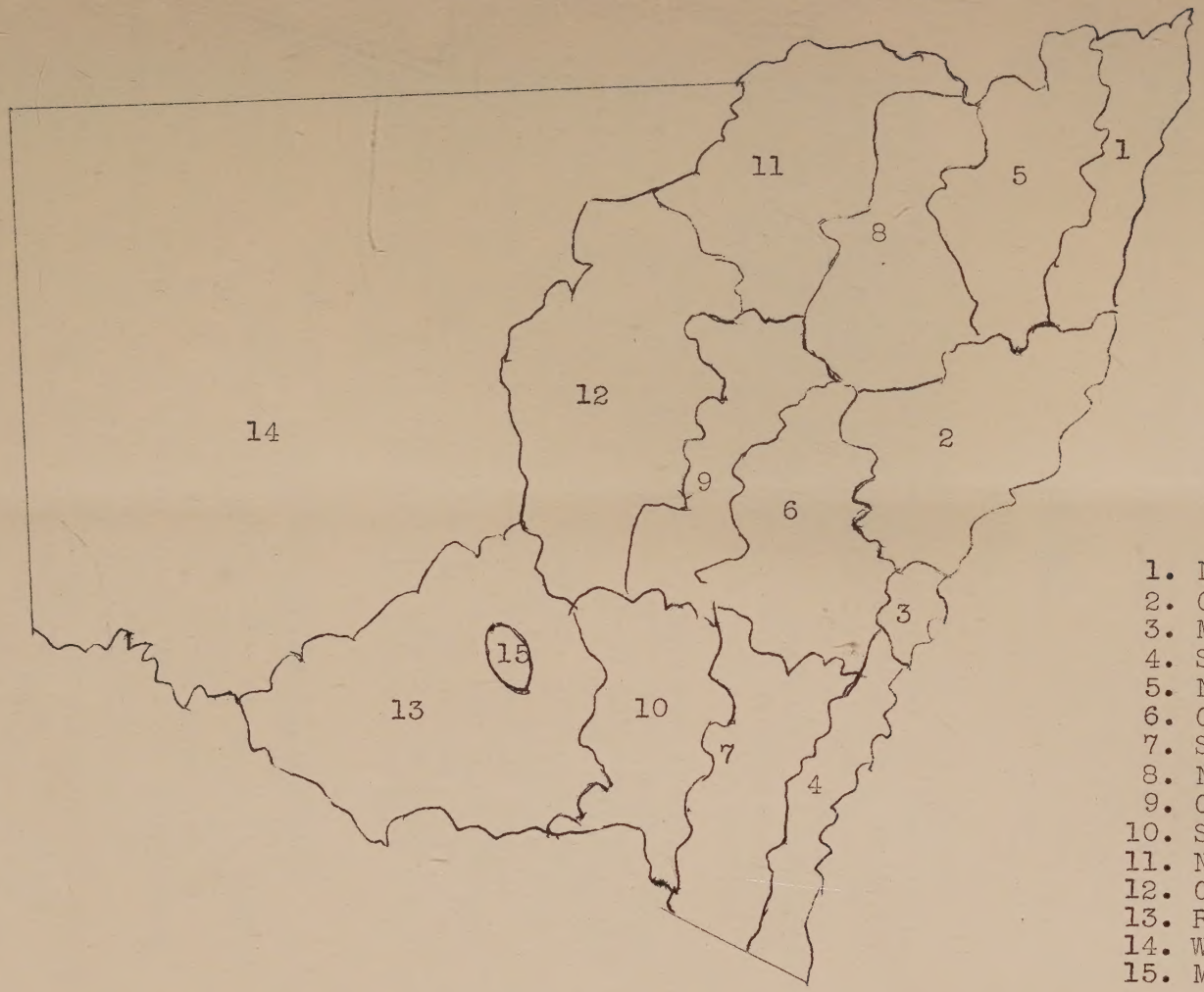


KEY

1. North Coast
2. Central Coast
3. Metropolitan Area
4. South Coast
5. Northern Tableland
6. Central Tableland
7. Southern Tableland
8. North Western Slope
9. Central Western Slope
10. South Western Slope
11. North Western Plain
12. Central Western Plain
13. Riverina
14. Western Division
15. Murrumbidgee Irrigation Areas

DISTRICTS OF NEW SOUTH WALES.

DEPARTMENT OF AGRICULTURE

NEW SOUTH WALES

BIOLOGICAL BRANCH - DIVISION OF SCIENCE SERVICES

# PLANT DISEASE SURVEY - 1947/48

Eighteenth Annual Report

## WEATHER CONDITIONS

Dry conditions prevailed early in the 1947/48 season. Spring and summer were chiefly cool with abundant and sometimes excessive rainfall throughout the State. Short periods of hot dry weather were experienced in February. The autumn was seasonable with ample rain to give the wheat crop a good start.

## CEREALS

### WHEAT

The 1947/48 wheat yield of 101,000,000 bushels was the highest ever recorded in New South Wales. This yield was obtained despite a stem rust epidemic and a very unfavourable harvesting period. Moreover, in many parts of the Southern and Central Western Wheat belt generally unfavourable conditions prevailed early in the season, resulting in poor seedling emergence and early crop growth.

Seasonal conditions improved greatly, however, and bountiful spring and early summer rains improved crop prospects to such an extent that early estimates pointed to a yield of between 110,000,000 and 120,000,000 bushels. However, the combined effect of the most serious stem rust epidemic ever experienced in this State and the serious losses incurred as a result of rain, hail and wind damage, leading to lodging, shattering, bleaching, the development of shot and sprung grain and loss in bushel weight, resulted in the final yield of 101,000,000 bushels.

STEM RUST (Puccinia graminis tritici) developed to unprecedented proportions and the results of a survey throughout the wheat belt showed that a loss of over 10,000,000 bushels occurred. Losses were most severe in the North West and in Central Western districts, where weather conditions were ideally suited to rust development. The disease was less serious in Southern districts, although South and East of Wagga (South-Western Slopes) heavy losses occurred. The majority of varieties except Celebration, Charter, Gabo, Kendee, Yalta and to a lesser extent Warigo, suffered severely and reports of 50-100 per cent yield reductions in varieties such as Eureka, Eureka 2, Pusa 4, Flora, Gular, Dundee, Bobin, Ford, Geeralying and Puora were received from many districts.

Of the total of 513,683 acres sown to the rust resistant varieties Celebration, Charter, Gabo, Kendee and Yalta, approximately 400,000 acres were confined to the North Western Slopes. Elsewhere in the State the remaining 114,205 acres represented only 2.5 per cent of the total acreage sown to wheat. The greater proportion of this acreage was sown in the Central Western districts surrounding Parkes and Mudgee.

FROST INJURY was responsible for serious reductions in yields, particularly in Central Western and Southern districts. Seedling stands were badly frosted in parts of the North West. Yield losses due to frost damage in the Young, Dubbo (Central Western Slopes); West Wyalong (South Western Slopes); and Mudgee (Central Tableland) alone totalled 1,400,000 bushels. In almost every instance, heaviest frost damage occurred in varieties sown out of season. In particular, the early maturing variety Gabo suffered severely. Reports of complete failure in this variety were received from Young, Griffith, Boree Creek and West Wyalong. Other varieties in which severe losses occurred were Bencubbin, Ford, Rapier, Charter, Yalta, Kendee, Bobin, Gular and Koala. Summarising reports received from District Agronomists and from observations made it would appear that unusually early sowings in Western and Southern districts followed by warm, spring-like conditions during May and early June produced unseasonably forward growth, which proved very susceptible to the severe frosts which occurred in July and August. Apart from head frosting, "ring-barking" (girdling of the stem below the head), leaf blighting and lower stem frosting were the commonest symptoms observed.

The necessity for sowing varieties at the correct time was demonstrated at West Wyalong (South Western Slopes), where three sowings of the variety Yalta in similar land on the one property gave the following yields:-

| | | |
|---|---|---|
| Sown mid April | - | Yield 7 bushels per acre. |
| " early May | - | " 24 " " " |
| " late May | - | " 36 " " " |

The differences in yield were solely attributable to frost injury.

In addition to the direct effect of frost, a large percentage of the lodging which occurred could be traced to severe basal stem frosting during the winter.

TAKE ALL (Ophiobolus graminis) again proved to be the most common of the root rot and foot rot diseases of wheat. It was reported, in varying degrees of severity from all sections of the wheat belt. Infections of 20-25 per cent were reported from several localities in the Riverina, the Central

Western Slopes and the North Western Slopes. Observations indicate that there is a tendency towards a higher incidence of take-all on irrigated land.

LOOSE SMUT (Ustilago tritici) occurred widely throughout the State, but no crops showing a higher degree of infection than 2-3 per cent were observed. It was observed most frequently in the varieties Ranee, Quadrat, Yalta, Fedweb and Baringa.

LEAF SPOT or WINTER BLIGHT (Septoria tritici) occurred extensively in Southern and Central Western districts, and was responsible for considerable losses. Its main effect was probably not so much to diminish yield as to lower the bushel weight of grain. The disease was not observed in the North West and it is only in the winter rainfall belt that Septoria is a disease of economic importance. Observations indicate that no commercially grown varieties in this State are immune to the disease but good field resistance is shown by a number of varieties, including Ford, Bordan, Sword and possibly Kondut, although there is conflicting evidence on the Septoria resistance of this variety.

BLACK POINT (Helminthosporium and Alternaria spp. associated) was more in evidence than usual due to the prolonged period of wet weather experienced at harvest time. In fact, comparatively few samples free of the disease were observed during the course of Surveys made in the Southern and Northern portions of the wheat belt. Reports indicated that the disease was no less common in the Central wheat belt.

Because of the high incidence of black point and shot and sprung grain, farmers were this year advised to dust with an organic mercurial and increase their seeding rate by 10 per cent where the seed sample warranted such treatment.

FALSE BLACK CHAFF (non-parasitic) was common, particularly in the Central and North Western portions of the wheat belt. It appears to be a physiological disorder characteristic of certain strains and varieties of wheat which finds expression under conditions of high temperature and humidity and low light intensity. The variety Hope and its derivatives Hofed and Warigo were particularly susceptible, as were the majority of Hope hybrids in the experimental plots at New England Experiment Farm. Yalta and Kendee were also commonly affected.

Symptoms of this disease may be confused with stem discolouration due to frost injury and the true black chaff disease (Xanthomonas translucens var. undulosa). Though conspicuous in the field, false black chaff was not responsible for any loss in yield as far as could be ascertained.

LEAF RUST (Puccinia triticina) was observed throughout the State, making its appearance as early as the first week in August on crops little more than 12 to 15 inches high. It was responsible for

considerable reduction in hay value and probably bushel weight in grain crops, but its true effect was masked by the serious stem rust epidemic which developed later in the season. It was particularly noticeable in North Western and Central Western areas.

GLUME BLOTCH (Septoria nodorum) occurred to a minor degree in Southern and Central Western districts. It was observed most frequently on the variety Yalta.

LEAF SPOT (Helminthosporium sativum) was observed at several centres in the Southern portion of the wheat belt. Infection in all instances was slight.

BLACK CHAFF (Xanthomonas translucens var. undulosa) was widespread throughout the wheat belt but infection was severe only in the North West. The varieties Charter, Fedweb and Kendee and derivatives of Hope, such as Hofed, showed the disease more than other varieties.

BASAL GLUME ROT (Pseudomonas atrofaciens) was observed to a minor degree on the North Western Slopes, Northern Tablelands and Central Western districts. It was also reported from Southern districts. In the North West the varieties Charter and Yalta were commonly affected.

POWDERY MILDEW (Erysiphe graminis) was more prevalent than usual this season, particularly in the North West. Yalta appeared to be the variety most commonly affected. Infection was also observed in Gabo and Pusa 4.

FOOT ROT (Helminthosporium sp.) was observed throughout the State. It was, however, neither as common nor as serious as take-all, and in almost every instance foot rot injury appeared to follow initial frost damage to the basal stem regions. The varieties Gabo and Charter were commonly affected.

SEEDLING BLIGHT (Fusarium culmorum) was reported only from the Murrumbidgee Irrigation Areas. Preliminary observations indicate that like take-all, this disease may cause increased losses in irrigated wheat crops unless adequate control measures are adopted.

DOWNY MILDEW (Sclerospora macrospora) was reported only from the South Western Slopes where slight infection occurred.

BUNT (Tilletia caries and T.foetida). During the war years there was a tendency towards an increase in the incidence of bunt. In certain areas in the Central Western wheat belt infection was sufficient on occasions to warrant the rejection of samples from bulk handling and the imposition of a dockage rate. For the most part this increased occurrence of the disease was traceable to either laxity on the part of the farmer or the failure of

wheat grading contractors to effectively treat seed wheat. In recent years Departmental field officers have stressed the necessity for adequate dusting of seed wheat and the result has been an appreciable decline in the incidence of the disease.

This season bunt was reported from occasional crops of Gular in the Dubbo (Central West) district and Rapier in the West Wyalong (South-Western Slopes) district; infection was slight. A report that a number of bunted wheat samples were rejected from bulk handling at Narromine (Central Western Slopes) was not substantiated.

FLAG SMUT (Urocystis tritici) was not observed in the field during the course of several disease surveys in the wheat belt. A report was received, however, that an occasional crop in the Tamworth (North Western Slopes) district showed a minor degree of infection. It would appear that in the last decade flagsmut has ceased to be a disease of economic importance. The decline in its incidence is apparently connected with (1) the widespread cultivation of resistant varieties, particularly Nabawa and its resistant derivatives such as Geeralying and Bencubbin; and (2) the acceptance of crop rotation by the farming community as a disease control measure, quite apart from its value as a soil fertility and structure maintenance measure.

WEATHER DAMAGE in conjunction with losses through stem rust infection, was largely instrumental in reducing what promised to be a harvest of between 110,000,000 and 120,000,000 bushels to one which ultimately yielded 101,000,000 bushels. Storms, hail, wind and rain variously resulted in lodging, shedding of grain, the development of shot and sprung grain, mottling, loss in bushel weight, etc. In some areas, e.g. the Mudgee (Central Tablelands) district, it was estimated that 90 per cent of the grain harvested, practically all of which was sprung or shot, would fall below the F.A.Q. standard of 59 lbs. per bushel. In the Young (South Western Slopes) district, approximately two-thirds of the wheat harvested fell below F.A.Q. standard. At Dubbo (Central Western Slopes) at least 50 per cent of the wheat fell below standard, as did 30 per cent of the grain handled in the Narromine (Central Western Tablelands) district. In each of these districts stem rust was also a contributing factor in reducing the bushel weight of grain.

State-wide losses were also experienced through bleaching, sprouting, shedding and lodging. Most severe damage occurred in the Young, West Wyalong, Tamworth, Dubbo and Mudgee districts, where the estimated bushelages either lost or damaged were as follows:-

| District | Bushels lost or damaged by | | | Total Bushelage Affected |
|---|---|---|---|---|
| | Lodging | Shedding | Bleaching and sprouting | |
| West Wyalong | 800,000 | 111,000 | 819,000 | 1,730,000 |
| Young | 442,000 | 579,000 | * | 1,021,000+ |
| Dubbo | 315,000 | 210,000 | 441,000 | 966,000 |
| Tamworth | * | * | 690,000 | 690,000+ |
| Mudgee | 278,000 | 124,000 | 216,000 | 618,000 |

* Figures not available

In some areas crops were so badly lodged as to render harvesting impossible, and in the West Wyalong (South Western Slopes) district alone some 2,000 acres were left unharvested.

Hail damage was also extensive as shown by the record hail insurance payment of £2,000,000 made to farmers in New South Wales by Australian tariff companies for losses in wheat, oat and barley crops during the season.

In the vicinity of Dunedoo (Central Tablelands) a hail storm in mid-December caused damage estimated at 20,000 bushels. An even greater loss was experienced in the Birriwa-Coolah (Central Tablelands) district where the loss was estimated at between 105,000 and 120,000 bushels.

## OATS

STEM RUST (*Puccinia graminis avenae*) was very prevalent throughout the State, but was most serious on the Northern Tablelands, North Western Slopes and in the Central Western districts. Several reports of the complete failure of grain crops were received from these areas. The varieties Fulghum, Belar, Algerian and Mulga suffered severely, and many crops of these varieties originally intended for grain purposes were cut for hay.

FROST INJURY was second only to stem rust as the cause of yield losses in oat crops during 1947/48. Losses were moderate to severe in Southern and Central Western New South Wales. Early sown crops of Algerian, Mulga and Fulghum in particular, suffered severely in the Riverina.

CROWN RUST (*Puccinia coronata*) was widespread but caused little damage except in

fodder crops on the Coast and Tablelands.

LEAF SPOT (Helminthosporium avenae) although State-wide in occurrence, was most prevalent in Southern and Western districts, where the degree of infection ranged from slight to moderately severe.

LOOSE SMUT (Ustilago avenae) was common throughout the State. Occasional crops showing severe infection (up to 35 per cent) were observed in Southern New South Wales. Crops grown from undusted infected seed were also severely infected on the Northern Tablelands. The most susceptible varieties were Fulghum, Algerian and White Tartarian.

COVERED SMUT (Ustilago kolleri) was, as usual, less in evidence than loose smut. Several crops of White Tartarian on the Northern Tablelands showed a moderate degree of infection. Slight to moderate infection was observed in occasional crops of Algerian and Fulghum in Southern and Central Western districts.

BACTERIAL STRIPE (Pseudomonas striafaciens) was observed in the varieties Gidgee and Belar in experimental plots at Temora Experiment Farm. It was also of common occurrence in South Eastern Riverina, although not sufficiently serious to cause any appreciable losses.

SPECKLED BLOTCH (Leptosphaeria avenaria = Septoria avenae) was very prevalent in Southern New South Wales. In some crops yields were reduced and hay quality lowered.

FOOT ROT (Helminthosporium sp.)was reported from several localities.

WEATHER DAMAGE. As with wheat, serious losses occurred as a result of rain, hail and wind damage. Losses were particularly heavy in the Central West, where they were estimated at an overall figure of 3 bushels per acre.

## BARLEY

SCALD (Rhyncosporium secalis) was the most serious disease observed in barley crops in New South Wales during 1947/48. It was most severe in the southern part of the State, where the degree of infection ranged from slight to severe.

STEM RUST (Puccinia graminis tritici) was widespread and responsible for moderate to severe losses in barley crops throughout the State.

LEAF RUST (Puccinia anomala = P. hordei) although common, was not responsible for any serious losses.

POWDERY MILDEW (Erysiphe graminis hordei) was responsible for minor losses in late sown crops grown for fodder purposes in Central Coastal districts.

COVERED SMUT (Ustilago hordei) was observed in occasional crops throughout the State. It was most common in the Southern Riverina in crops of the variety Pryor, where one crop showing 25 to 30 per cent infection was observed. Several crops of malting barley showing 10 per cent infection were observed in the North West.

LOOSE SMUT (Ustilago nuda) was observed in barley crops at Wagga (South Western Slopes) and Finley (Riverina district).

NET BLOTCH (Helminthosporium teres = Pyrenophora teres) was observed at Wagga (South Western Slopes) and at several centres in South Eastern Riverina. Infection, however, was slight in all instances and yields were not materially affected.

## RYE

LEAF RUST (Puccinia dispersa) was observed on the Northern Tablelands and on the South Western Slopes. Infection was slight in both areas.

No other parasitic diseases of rye were recorded during the season.

## BROOM MILLET

No records.

## JAPANESE MILLET

SMUT (Cintractia crus-galli) was observed in a sample forwarded from the North Coast. Infection was slight.

LEAF SPOT (Helminthosporium sp.) was recorded from Central and North Coastal areas.

## GRAIN SORGHUM

KERNEL SMUT (Sphacelotheca sorghi) was observed in several varieties of grain sorghum and in saccaline on the South Coast. Infection was slight. It was also reported from the Central Coast and the North West. A crop of Wheatland Milo at Wiseman's Ferry (Central Coast) showed 15 per cent infection.

HEAD SMUT (Sorosporium reilianum) caused slight reductions in the yield of several varieties on the South Coast. Saccaline was also infected.

ROOT and BASAL STALK ROT (Colletotrichum sp.) caused minor losses in the North West.

LEAF BLIGHT (Helminthosporium turcicum) was observed to a slight to moderate degree in all sorghum growing areas.

RUST (Puccinia purpurea) was widespread but occurred to only a slight degree.

## MAIZE

ROOT and BASAL STALK ROT (Gibberella saubinetii, G.moniliformis and G.fujikuroi var. subglutinans) occurred extensively and was reported from all maize growing districts. In the majority of instances, however, losses were not greater than 5 to 10 per cent. A higher incidence was observed on the Central and Northern Coastal areas than elsewhere. Gibberella saubinetii occurred more frequently than either G.moniliformis or G.fujikuroi var. subglutinans.

LEAF BLIGHT (Helminthosporium turcicum) occurred extensively but apart from severe infection of late crops on the Central and South Coast, and to a somewhat lesser extent on the Northern Tablelands, losses were not serious.

COB and GRAIN ROT (Gibberella saubinetii, G.moniliformis and G.fujikuroi var. subglutinans) was reported from all maize growing areas. Apart from primary infection, considerable secondary rotting occurred following corn ear worm attack. For the most part losses were not greater than usual. However, 50 per cent grain loss in some hybrid material at Grafton Experiment Farm was recorded. The organism responsible was G.fujikuroi var. subglutinans.

DRY ROT (Diplodia zeae) developed to a moderate degree in crops on the North Coast and Tablelands. In the latter area some losses of 5 per cent were recorded. It also occurred in the Richmond-Windsor (outer Metropolitan) district.

GRAIN ROT and DISCOLOURATION (various organisms, chiefly spp. of Cephalothecium, Botrytis and Trichoderma) was reported from Grafton (North Coast) and Bega (South Coast).

SEEDLING BLIGHT (Gibberella saubinetii) caused slight to moderate reduction in seedling stands on the Northern Tablelands.

CROWN CRACK (non-parasitic) occurred on the South Coast and Northern Tablelands.

HEAD SMUT (Sorosporium reilianum) was recorded only from the South Coast where it appeared to be more prevalent than for some years past, particularly in the Bega (South Coast) district.

RUST (Puccinia sorghi) was widespread in occurrence but infection for the most part was slight, and not sufficient to affect yields.

BOIL SMUT (Ustilago maydis). The quarantine areas in the Bathurst (Central Tablelands) district were again surveyed this season. No evidence of the disease was observed.

In addition to the Bathurst survey, a maize and sweet corn crop inspection programme, covering all known plantings of imported seed was carried out. Crops were inspected in the Richmond-Windsor (outer Metropolitan) district, and the Murrumbidgee Irrigation Area and on the Northern Tablelands. No evidence of the disease was observed.

## RICE

BROWN GLUME STAIN (non-parasitic) was reported widely from the Murrumbidgee Irrigation Areas. This condition somewhat resembles the false black chaff condition of wheat, although, unlike this disease, it appears to be confined entirely to the glumes. It has repeatedly occurred following abnormally cold conditions at anthesis.

## SUGAR CANE

Information supplied by the Colonial Sugar Refining Co. Ltd. shows that during the 1947/48 season, 267,261 tons of sugar cane were crushed. Losses due to disease were estimated as follows:-

| | | |
|---|---|---|
| FIJI DISEASE (virus) | - | 973 tons |
| MOSAIC (virus) | - | 32 " |
| RED STRIPE (*Xanthomonas rubrilineans*) | - | 118 " |
| RED ROT (*Colletotrichum falcatum*) | - | 20 " |
| | | 1,143 |

Thus losses amounted to less than 0.5 per cent of the total tonnage crushed.

Traces of diseases other than those for which tonnage losses have been recorded were observed, but their effect on yield was negligible. The following information has been abstracted from the Colonial Sugar Refining Co.'s agricultural circulars for 1948.

FIJI DISEASE (virus) is still the most serious disease with which growers have to contend. However, the use of resistant varieties and the adoption of recommended control measures has led to a continued steady reduction in the degree of infection with this disease. Losses from Fiji disease this year totalled 973 tons as compared with 2,605 tons last year. The disease is reported to be still widespread in the Clarence River (North Coast) area and is also troublesome on the Richmond River (North Coast).

RED STRIPE (Xanthomonas rubrilineans) was second in importance to Fiji disease. It was reported mainly on the variety Pollux in the Clarence River (North Coast) area.

MOSAIC (virus). The use of resistant varieties and the elimination of the susceptible variety Comus from the Tweed River (North Coast) plantings has led to further reductions in losses from this disease. Mosaic was not serious in the Richmond River (North Coast) district last season and was observed only on the variety Akbar in the Clarence River (North Coast) area.

RED ROT (Colletotrichum falcatum) was responsible for minor losses only. Areas associated with outbreaks of red rot were not disclosed.

LEAF SCALD (Bacterium albilineans) was observed in a field of the variety Solon, in the Tweed River (North Coast) area. Minor outbreaks at Teven Creek and Broadwater (North Coast) were reported to have been brought under control.

EYESPOT DISEASE (Helminthosporium sacchari) was observed affecting the leaves of mature cane during the winter months. It was particularly noticeable in crops of the variety Atlas growing on rich sandy soils in the Clarence River (North Coast) area. Trace infection only was observed on other varieties in this area and in the Richmond and Tweed River districts.

GUMMING DISEASE (Xanthomonas vasculorum). Minor infection was reported from the Richmond River area (North Coast). The mill supply area on the Tweed River (North Coast) is reported to be free from this disease.

## SWEET CORN

ROOT and BASAL STALK ROT (Gibberella saubinetii) caused serious losses in the Richmond-Windsor (outer Metropolitan) area. Late crops in inbred seed lines in particular were severely attacked and yield losses up to 80 per cent were observed. This disease constitutes a serious problem in the maize and sweet corn growing areas surrounding the Hawkesbury River (outer Metropolitan area), where maize has been grown for over a century. Unless more diversified farming practices are adopted, root and basal stalk rot will continue to cause heavy losses in maize and sweet corn crops in these areas.

DRY ROT (Diplodia zeae) caused minor losses on the Central Coast, Northern Tablelands and the Murrumbidgee Irrigation Areas.

LEAF BLIGHT (Helminthosporium turcicum) was quite widespread on the Coast and Tablelands but caused extensive damage in occasional crops only. Slight infection was also observed on the Murrumbidgee Irrigation Areas.

RUST (Puccinia sorghi) was also widespread but infection was not responsible for any serious losses.

GRAIN ROT (Rhizopus nigricans) was observed in an occasional cob on the Murrumbidgee Irrigation Areas.

## FIELD AND FODDER CROPS

### CLOVERS

RUST (Uromyces trifolii) was reported from the South Western Slopes on subterranean clover (Trifolium subterraneum). Infection was very heavy in the Batlow (South Western Slopes) district. The disease was also severe on the Central Tablelands and foliage losses ranging from 20 to 60 per cent were observed in the Rylstone district.

STEM DECAY (Ascochyta sp.) was favoured by protracted moist spring weather in the Orange-Bathurst (Central Tablelands) district. The disease was widespread in this area on subterranean clover and the grazing value of badly affected stands was reduced by as much as 75 per cent in several instances.

STEM ROT (Sclerotium rolfsii) occurred to a minor extent in the red clover (Trifolium pratense) breeding plots at the New England Experiment Farm, Glen Innes (Northern Tablelands). This is apparently the first record of S. rolfsii on this ~~Coast~~ CLOVER in New South Wales.

### COWPEAS

LEAF SPOT (Cercospora sp.). Severe infection was reported in a crop grown at Grafton Experiment Farm. Stems and pods were also infected.

POWDERY MILDEW (Oidium sp.) was reported from Grafton (North Coast) where a moderate degree of infection occurred in crops grown for green manure purposes.

### FIELD PEAS

BACTERIAL BLIGHT (Pseudomonas pisi) seriously affected a green manure crop at Bathurst Experiment Farm (Central Tablelands) where a 30 per cent infection was observed.

### LINSEED

WILT (Fusarium lini) was recorded for the first time in New South Wales. It occurred in several crops of the variety Walsh growing in the North West. The degree of infection was not high. Nevertheless, its occurrence in this State is a matter for concern.

RUST (Melampsora lini) occurred to a minor degree in the North West, on an undetermined variety. Irrigated varietal plots on the Murrumbidgee Irrigation Areas also showed slight infection.

## LUCERNE

STEM NEMATODE DISEASE (Ditylenchus dipsaci) was reported from several areas. Serious losses occurred on the Burrundulla flat near Mudgee on the Central Tablelands, and in the Hunter and Manning district (Central Coast). A loss of 30 per cent of the plants in the pasture nursery plots at Leeton Experiment Farm (Murrumbidgee Irrigation Areas) was reported. The disease was also widespread on the North Coast, particularly in the Lismore and Kyogle districts where it has thinned out many stands.

ROOT ROT (Rhizoctonia bataticola = Macrophomina phaseoli) caused a premature thinning out of many comparatively young lucerne stands on the rich Hunter River flats near Maitland, (Central Coast). In the Mudgee (Central Tablelands) district up to 50 per cent of the plants were killed in some stands. The disease was also reported from Lismore (North Coast) where losses were less extensive.

DOWNY MILDEW (Peronospora trifoliorum) severely affected a young 70 acre stand of autumn sown lucerne at Finley (Riverina). The disease was also reported in young stands in the Singleton (Central Coast) district.

LEAF SPOT (Pseudopeziza medicaginis) was widespread in its occurrence. Losses, however, were not serious except in the Metropolitan Area where considerable defoliation occurred in some stands. Some losses were experienced in the Hunter and Manning district, (Central Coast).

RUST (Uromyces medicaginis) occurred extensively but infection for the most part was light to moderate. It was most prevalent in the Metropolitan Area and in the Hunter and Manning district.

WITCHES BROOM (virus) was in evidence in many old stands in the Western districts.

## LUPINS

COLLAR ROT (Rhizoctonia solani) was reported from Rylstone (Central Tablelands).

STRIPE (virus) was reported from Orange (Central Tablelands).

## PEANUTS

ROOT and CROWN ROT (Sclerotinia minor) was reported from Yanco Experiment Farm (Murrumbidgee Irrigation Areas). This constitutes the first record

of this disease in New South Wales. Apart from a small patch in which 10 per cent of the plants were affected only an occasional plant was diseased.

BLACK SPOT (Cercospora personata) was moderately severe in the Lismore (North Coast) district.

BIG BUD (virus?) was recorded for the first time on this host from Yanco Experiment Farm (Murrumbidgee Irrigation Areas).

## RAPE

WHITE RUST (Albugo candida) was recorded for the first time on this host from Edgeroi (North Central Plain) where severe infection occurred in a 100 acre crop.

## SOYBEANS

BACTERIAL BLIGHT (Pseudomonas glycinea) was again common in soybean crops this season. It was not responsible for any serious reductions in yield.

BACTERIAL PUSTULE (Xanthomonas phaseoli var. sojense) was observed on the Murrumbidgee Irrigation Areas where infection was severe in a crop grown at Yanco Experiment Farm. Slight infection was reported from Grafton (North Coast).

FROG EYE LEAF SPOT (Cercospora diazu) was recorded for the first time in this State, at Grafton (North Coast), where the disease was widespread and severe in a crop of the variety Potch 169.

LEAF SPOT (Phyllosticta sojaecola) occurred to a slight degree on the North Coast.

MOSAIC (virus) was reported from the North Coast. Although this constitutes the first official record of the occurrence of this disease in New South Wales, it appears that the disease has been present for a number of years.

ROOT KNOT (Heterodera marioni) caused heavy losses in a crop at Grafton (North Coast).

## TOBACCO

The acreage sown to tobacco in New South Wales showed a further decline this season to 380 acres, as compared with 415 acres in the 1946/47 season.

Early reports indicated that practically all crops were retarded by the abnormally wet season. Water-logged soil conditions and extremely cold night temperatures tended to produce stunted growth.

DOWNY MILDEW (Peronospora tabacina) was rampant early in the season and occasioned heavy losses in the seed bed in Northern areas. Downy

mildew was also recorded on Nicotiana rustica at Bathurst (Central Tableland).

MOSAIC (virus) was responsible for minor losses during the season.

YELLOW DWARF (virus) was also responsible for slight losses.

SPOTTED WILT (virus) was observed in a crop of Nicotiana rustica, growing in the Bathurst district (Central Tablelands).

VARIEGATED FOLIAGE (genetic abnormality) was reported in Nicotiana rustica from Bathurst (Central Tablelands).

ROOT KNOT (Heterodera marioni) was again troublesome in the Ashford (North Western Slopes) district.

## MISCELLANEOUS GRASSES

### BARLEY GRASS (Hordeum leporinum)

LEAF SPOT (Helminthosporium sp.) was widespread. It was particularly severe in the North West.

STEM RUST (Puccinia graminis) occurred widely on barley grass throughout the North West, particularly, and the importance of this grass as an alternate host of the stem rust disease of cereals cannot be over-estimated.

TAKE-ALL (Ophiobulus graminis) was observed at several centres in Southern and North Western districts. As an alternate host of take-all, barley grass is a serious problem in many wheat growing areas, and experience has shown that virgin or pasture land carrying barley grass should always be sown first to oats.

### BENT GRASS (Agrostis spp.)

BROWN PATCH (Rhizoctonia solani) caused quite extensive damage in the Metropolitan Area. It was also reported from the Central Tablelands.

GREEN SCUM (algae) caused a minor degree of trouble in the Metropolitan Area and at Orange (Central Tableland).

### BUFFALO GRASS (Stenotaphrum secundatum)

BROWN PATCH (Curvularia (lunata?)) was reported from the Murrumbidgee Irrigation Areas.

LEAF SPOT (Piricularia sp.) was severe in several lawns in the Metropolitan Area during the summer months.

FAIRY RING (undetermined) was reported in a lawn at Jerilderie (Riverina district).

DIE BACK (Ithyphallus rubicundus). A slow die-back condition in a buffalo grass lawn at Concord (Metropolitan Area) was found to be due to a dense sub-surface growth of this Gasteromycete.

## BULBOUS BLUE GRASS (Poa bulbosa)

LEAF RUST (Puccinia poarum) caused considerable defoliation in a lawn at Orange (Central Tableland).

## COUCH GRASS (Cynodon dactylon)

BROWN PATCH (Rhizoctonia solani) was again of common occurrence in couch grass lawns and greens. It was reported from the Metropolitan Area, the Riverina, Central Tablelands, North and South Coasts, Southern Tablelands and South Western Slopes.

SMUT (Ustilago cynodontis) was again prevalent, particularly in the Metropolitan Area.

## LESSER CANARY GRASS (Phalaris minor)

POWDERY MILDEW (Erysiphe graminis) Favoured by cool showery conditions, heavy infection occurred in the spring on the Murrumbidgee Irrigation Areas.

## PASPALUM (Paspalum dilatatum)

ERGOT (Claviceps paspali) was very common, particularly on the Northern Tablelands and the Coastal belt. Species of Cerebella and Fusarium were commonly associated with the condition.

## PERENNIAL RYE GRASS (Lolium perenne)

STEM RUST (Puccinia graminis lolii) was observed at several centres in South Eastern Riverina. Infection was light to moderate.

FROST INJURY was observed at Temora (South Western Slopes).

## PRAIRIE GRASS (Bromus unioloides)

SMUT (Ustilago bromivora) was of widespread occurrence. Severe infection was reported from several districts on the Central Tablelands.

## SUMMER GRASS (Digitaria adscendens)

LEAF SPOT (Piricularia sp.) was prevalent in the Metropolitan Area.

## WALLABY GRASS (Danthonia sp.)

BLACK SMUT (Ustilago readeri) was reported on several species of Wallaby grass, during the season. It was serious on Danthonia penicillata and D.semi-annularis on the Central Tablelands where seed setting and regeneration were considerably reduced.

# F R U I T

## CANE FRUITS

### BOYSENBERRY and YOUNGBERRY

ANTHRACNOSE (Elsinoe veneta) was recorded causing fairly severe leaf and cane spotting at Robertson (South Coast). Commercial crops at Batlow (South Western Slopes) were quite free of the disease.

DIE-BACK (Verticillium dahliae) was reported for the first time on this host in New South Wales from a Metropolitan garden.

### CURRANT, BLACK

LEAF SPOT (Mycosphaerella ribis). Following almost continuous wet weather during spring and early summer, a heavy development of leaf spot occurred in commercial blocks of black currant at Batlow (South Western Slopes). It was also reported from Bathurst and Oberon (Central Tableland).

FOOT ROT (Armillaria mellea) was responsible for about 25 per cent loss of young plants in a Batlow (South Western Slopes) orchard. Clearing of the land had been incomplete, some forest tree stumps still remaining in the block.

### LOGANBERRY

RUST (Phragmidium sp.) and ANTHRACNOSE (Elsinoe veneta) were reported from Metropolitan gardens.

### YOUNGBERRY

See Boysenberry.

## CITRUS FRUITS

PHYTOPHTHORA ROOT and COLLAR ROT (Phytophthora citrophthora). No seed bed outbreaks of this disease were observed in nurseries in the spring of 1947 or autumn 1948. Heavy losses have been experienced in several Metropolitan nurseries, of trees planted out in nursery rows from seed beds infected in autumn 1946 and 1947. In one nursery some thousands of trees

had to be destroyed in late spring 1947 because of the prevalence and rapid spread of root rot, and consequent losses suffered by growers who had been supplied with trees from this bed for spring planting. Some collar rot occurred among yearling lemon trees in several nurseries.

Trees weakened from root rot at Windsor and Penrith (outer Metropolitan area) suffered severe frost injury in winter 1947.

Continued wet spring and summer weather resulted in considerable root loss among trees on the Hawkesbury (outer Metropolitan) flats and in badly drained localities in the Hills district (outer Metropolitan), and Ourimbah (Central Coast). The effect on the trees was not manifest until early autumn, as yellowing and reduction in size of leaves. Trees on trifoliata stock in the same localities remained vigorous and healthy.

In the Murrumbidgee Irrigation Areas improved irrigation practice and continued dry winter conditions have resulted in maintenance of tree health in unaffected blocks, but a slow decline of affected trees continues here and in Murray River settlements.

Root rot was observed in an irrigated orchard on volcanic soil at Grafton (North Coast).

Collar rot was very prevalent on lemons in home gardens and orchards in coastal districts.

BLACK SPOT (Guignardia citricarpa)

(a) Crop maturing winter, spring and summer 1947 (blossoming spring 1946.) Most Valencia orange crops in the Gosford (Central Coast) district remained free from Black Spot during the late spring and early summer. Most crops even on non-sprayed trees were clean until the last week in December, when a sudden development of the disease in a large number of orchards followed shortly after high temperatures on 28th and 29th December. Fruit on old trees was the first to be affected. The orchardists with small scale plantings are usually those who suffer most in severe epiphytotics, as a greater proportion have not made adequate provision of water for spraying and irrigation.

In the Hills (outer Metropolitan) district the disease appeared generally in milder form than usual in September, but cool weather held it in check. By December losses were experienced in unsprayed blocks.

(b) Crop maturing winter, spring and summer 1948 (blossoming spring 1947). Wet weather in the spring interfered somewhat with Black Spot spray applications. Although the spring and summer season was

abnormally mild and wet, with only a few brief periods of hot weather, first signs of Black Spot have shown up three to five months earlier than usual. Speckled Blotch, which is considered to be one of the manifestations of Black Spot, was recorded from orchards on the Hawkesbury (outer Metropolitan) flats in May on maincrop Washington Naval, Valencia, Jaffa and Siletta oranges and on Marsh grapefruit, but not on Emperor mandarins. Virulent lesions of Black Spot were associated with the speckled blotch on fruit of all varieties. Infection was observed to be most frequent in the more sheltered parts of the tree in contrast to the usual development of Black Spot on exposed fruit on the northern side first. The total number of fruit affected was not large but the incidence was fairly general. Speckled blotch has not been observed since the early 1930's, when a similar cycle of weather was experienced. On maincrop lemons in the Hills (outer Metropolitan) district the first lesions were observed in May and in some blocks 5 per cent of the fruit was marked by early June.

MELANOSE (Diaporthe citri). In the Gosford (Central Coast) district little Melanose was evident on Valencia fruit during the past season. It was recorded on unsprayed Washington Navel Oranges. The fungus was active as a wood rotting agent in less vigorous trees and also on Skeleton-pruned trees. The main damage to old or weak trees was evident during early winter as the sudden wilting of small branches. This is due to the extension of the fungus from small dead laterals into the living wood of the branch. Diaporthe citri is a slow growing organism in the wood of orange trees and its activity is likely to pass unnoticed until branches have been killed. Pruning out the old spent wood carrying active internal mycelium appears to be the only method of removing inoculum.

The infection of the new growth of skeleton-pruned trees was observed in September. Where infection was particularly heavy, some die-back of the new growth has been observed. Occasionally the fungus works back into the wood of the main branches. In such cases skeleton pruning, far from invigorating the tree, results in further reduction of vigour. Removal of pruning debris which harbours the fungus, the application of water-proof paint to the pruning cuts and the application of a Bordeaux spray to the new growth have given encouraging results.

In a West Pennant Hills (Metropolitan) orchard of 46 year-old citrus trees on trifoliata and lemon stock, wilting of whole branches of the trees was found to be the result of Diaporthe citri working through the wood in the crown region. The fungus had evidently become established in roots killed by drought conditions years previously but had become specially active following continuous wet spring and summer conditions.

In the Hills (outer Metropolitan) district melanose was very much in evidence on fruit of older trees, as wet spring weather had delayed application of sprays.

Mandarin crops in the Hawkesbury (outer Metropolitan) flats showed considerable marking; a second infection following a wet spell in May resulted in some bronzing of the rind of fully grown, partially coloured fruit.

An unusual manifestation of the disease occurred in the spring in a Metropolitan nursery. Bud-take in this nursery had been poor. The dead buds were invaded by Diaporthe citri, which extended into the living stocks, causing a type of collar rot.

SEPTORIA SPOT (Septoria depressa). This disease appears to be increasing in importance on the Murrumbidgee Irrigation Areas. Though losses were not high (7 to 10 per cent) in unsprayed orchards, the distribution of the disease throughout the Area appears to be more general than previously.

SCAB (Sphaceloma fawcettii scabiosa). Favoured by weather conditions, which also interfered with spraying, infection of maincrop lemon fruits was severe in Gosford (Central Coast) and Hills (outer Metropolitan) districts, and in home gardens in the Metropolitan Area, particularly on old trees. Fruit on young trees was not heavily infected. Many lemon growers do not apply scab sprays to young trees until fruit infection begins to appear. By that time the disease has become well established on the green wood and losses are experienced in later years, despite routine spraying. Routine spraying of young trees before the disease becomes established would prevent this build-up.

Scab was more serious in its effects on nursery stocks of rough lemon both in seed bed and nursery rows, than for many years. Growth of affected stocks was greatly retarded. Nurseries at Carlingford, Asquith, Kenthurst (Metropolitan) and Gosford (Central Coast) were affected.

Scab was also recorded on Murami kumquat (Fortunella japonica).

ARMILLARIA ROOT ROT (Armillaria mellea) continues to be a major problem in the Mangrove Mountain, Maroota and Hawkesbury River (Central Coast) districts.

SCLEROTINIA BLIGHT (Sclerotinia sclerotiorum) favoured by cool moist weather, was particularly severe in Metropolitan nurseries in late winter and early spring 1947, on rough lemon and trifoliata seedlings.

RHIZOCTONIA COLLAR ROT (Rhizoctonia solani) was responsible for considerable losses amongst young seedlings of rough lemon stocks during late summer.

BROWN ROT (Phytophthora citrophthora) was recorded from several orchards at Lisarow (Central Coast) during the late autumn, but chiefly on fallen fruit; a slight amount of infection was observed in some lemon orchards in the Hills (outer Metropolitan) district during the early winter. It was also recorded, mostly on fallen fruit, from home gardens in the Metropolitan area. Heavy falls of Valencias occurred in coastal orchards during early May and it was surprising that more fruit infection was not observed, particularly on the more poorly drained orchards.

SOOTY BLOTCH and FLY SPECK (Gloeodes pomigera and Leptothyrium pomi). Light infections were recorded on unsprayed navel orange fruits at Lisarow (Central Coast) and on fruit of Poncirus trifoliata at Dooralong (Central Coast) and Thornleigh (Metropolitan).

GREEN MOULD (Penicillium spp.). Associated Packing Houses have expressed concern over the increase in losses of fruit during the past several seasons due to mould activity. There appears to be considerable evidence to indicate that poor orchard practice, rough lug boxes and packing cases, as well as careless transport, poor shed hygiene and the unwillingness to use a disinfectant bath in sheds, have all contributed to the increase.

FELT FUNGUS (Septobasidium pseudopedicellatum) was recorded from orchards at Grafton and Coffs Harbour (North Coast) and the Hawkesbury River (Central Coast).

PINK DISEASE (Corticium salmonicola) was recorded on orange trees in the Clarence River (North Coast) district.

MANDARIN BROWN SPOT (cause not known). No records.

CITRUS BLAST (Pseudomonas syringae). No records.

PSOROSIS (virus). No new records. A condition much resembling psorosis was observed on orange, grapefruit and mandarin varieties at Grafton Experiment Farm (North Coast). It is believed to be due to heavy white louse infestation.

WOOD POCKET (? virus). A condition shown by a single Marsh grapefruit tree at Grafton Experiment Farm (North Coast), and affecting a number of the same variety in a Somersby (Central Coast) orchard, resembles to a certain extent the disease described as wood pocket virus on lemons in California recently. The symptoms are rather elongated pits developing on the maturing branches, giving them a gnarled appearance.

EXANTHEMA (copper deficiency). Mild copper deficiency is widespread in the Gosford (Central Coast) district. Blossom drop was particularly serious during spring 1947 and it is considered that exanthema is most likely responsible. As well as the well known symptoms, a leaf yellowing condition has been observed during autumn 1948 on orange trees, particularly on those portions of the tree where heavy crops were carried during the previous season.

Exanthema is more serious on Washington Navel orange trees than Valencias, possibly because the rate of growth of the fruit is faster, making greater demands on the tree over a short period of time. The routine Bordeaux Mixture applications no doubt partially control exanthema in Valencia trees, but on the lighter soils of Mangrove Mountain-Somersby (Central Coast) even these sprays applied regularly each year are insufficient to supply the tree's copper requirements.

MOTTLE LEAF (zinc deficiency), as usual, was general in Western districts, and was observed on mandarins in sandy soil in the Windsor (outer Metropolitan) area. In the Gosford (Central Coast) district typical symptoms were seen on the new growth of cut-back trees of all varieties during the spring, though prior to cutting back no zinc deficiency symptoms were seen. Rapid recovery followed application of zinc sprays, though in many cases little improvement occurred until adequate copper also had been supplied. It appears likely that temporary shortages of zinc occur when trees are making rapid growth after having been cut back.

YELLOW LEAF (magnesium deficiency). Because of wartime shortage of high grade dolomite, many Gosford (Central Coast) orchards were severely affected with yellow leaf. During the past season supplies of good grade dolomite have been available and its use has been general. The most serious leaf yellowing was observed on lemon trees carrying record crops of fruit which growers were unable to market because of poor prices. Fruit was allowed to become tree ripe and consequently the foliage of many trees yellowed badly as magnesium was transferred to the maturing seeds. Symptoms of magnesium deficiency were also seen in orchards in the Hills district (outer Metropolitan) and sandy soils of the Hawkesbury River (outer Metropolitan) and inland in the lower Murray River districts.

BURNT LEAF (potassium deficiency) occurred in a very mild form on some of the less vigorous Washington Navel orange trees in the Lisarow (Central Coast) area during October-November.

MOTTLE LEAF (manganese deficiency) was reported from home gardens in the Newcastle (Central Coast) and Metropolitan districts.

GOLDEN TOP (manganese toxicity). This condition was observed in a very mild form at Dooralong (Central Coast) on seven-year old trees in shallow alluvial soil.

CHLOROSIS (Excess alkalinity) was reported from Narrabri (North Central Plain) and Wentworth (Western Division).

FRUIT DROP. A heavy drop of young fruit occurred from Washington Navel orange trees throughout the Gosford (Central Coast) district shortly after blossoming. It was observed that the drop was more serious on trees that had blossomed very heavily and had also shed the greater part of this blossom. These trees had made very little spring foliage growth, consequently the blossom had developed on previous season's growth rather than current season's growth. The trees were mildly affected with Exanthema, and it is considered likely that the dropping of the small fruits may have been influenced by the unthriftiness brought on by this deficiency disease. Only Washington Navel orange trees were affected.

Valencia orange trees in coastal orchards suffered heavy falls of maincrop fruit early in May. Few falls were observed from Washington Navel orange trees at this time, however. Falls did not appear to be associated with poor drainage or loss of fibre root. The fall was associated with a change in colour of the fruit which occurred after the first cold spell was experienced. Washington Navel oranges had commenced to change colour several weeks earlier. The cause of the drop is unknown.

OLEOCELLOSIS was recorded from Barooga (Riverina district).

GRANULATION was recorded from Woy Woy (Central Coast) on young Washington Navel orange trees.

ENDOXEROSIS was recorded in lemons from a number of coastal districts, but caused negligible loss.

LEAF PUCKERING occurred on Wheeny grapefruit during spring, as usual.

## POME AND STONE FRUITS

This season pome and stone fruits carried very heavy crops, the quality of which was adversely affected by the high level of disease incidence. The vigour and growth of trees were outstanding.

### POME FRUITS

#### APPLE

BLACK SPOT (Venturia inaequalis). The 1947/48 season was one of the worst "black spot years" on record, the incidence of the disease being extremely heavy in all districts within its temperature range, with the notable exception of Glen Innes (Northern Tablelands) where it has never occurred.

Experimental and observational evidence has indicated that the current programme of very weak lime sulphur sprays is unsuitable under the

epiphytotic conditions which prevailed this season. The value of the early Bordeaux Mixture sprays was clearly demonstrated. The incidence of late secondary spot was heavy in all districts, and observations suggest that a weak Bordeaux Mixture spray late in the season is more effective than lime sulphur in controlling late spot. No damage to trees or fruit was evident from the use of this spray.

The variability in disease incidence within districts was very great, even between orchards receiving the same spray programme. Apart from the variation in the thoroughness of spraying, it was clearly evident that those orchardists who commenced the season with a relatively clean orchard experienced much less difficulty in controlling the disease than those who commenced with a heavily infected orchard.

In a nursery at Batlow (South Western Slopes), seedling apple trees were affected to such a degree that their growth was seriously stunted. Unsprayed trees at Orange (Central Tableland) were practically defoliated.

The percentage of unsaleable fruit was very high, and factories would not handle the amount of factory grade fruit offered. Results of experiments with orchard floor spraying have been so encouraging that field scale trials are being arranged for the coming season.

POWDERY MILDEW (Podosphaera leucotricha) was more evident than usual at Bathurst and Orange (Central Tableland) although it was generally held in check by the black spot sulphur sprays. The disease has also been reported from Batlow (South Western Slopes) and Canberra (Southern Tableland) and from a Metropolitan nursery where a moderate attack occurred on one-year-old Northern Spy apple stocks. A report from the Northern Tablelands indicates that powdery mildew is building up to serious proportions, especially in the Armidale-Kentucky area (Northern Tablelands).

DIE-BACK (Dothiorella sp.). The limb canker phase of the disease was not apparent this season, probably because of the enhanced vigour of the trees under the influence of extremely favourable growing conditions. However, a spur blight condition with which Dothiorella was associated, was of fairly general occurrence throughout the Hills (outer Metropolitan) district, assuming serious proportions in some instances. Some bark lesions were noted on current season growth only.

Die-back, following attack by the pin-hole borer (Xyleborus pseudangustatus) with subsequent wood rotting, caused by a fungus which closely resembles Dothiorella, did not occur. No borer activity was noted.

McINTOSH RED TRUNK CANKER (Dothiorella sp.). This serious canker disease, affecting trunks and lower limbs mainly of the McIntosh Red variety in

the Oakdale-Oaks-Orangeville (outer Metropolitan) area, was of no consequence this season. Some old cankers showed a little extension but no new infections occurred. It is thought that the pin-hole borer (Xyleborus pseudangustatus) may act as a vector in the establishment of new infections, but this has not yet been proved. No current season pin-hole borer activity was noted.

DIE-BACKS, with which no pathogen is associated, were not in evidence this season, and trees in orchards which previously had caused concern, grew vigorously and carried heavy crops without trace of any trouble. This suggests that the trouble, which caused so much concern in 1943/44, particularly in the Orange (Central Tableland) district, has been due to drought, either directly or indirectly through unbalanced availability of mineral nutrients.

Trees generally seem to have recovered from the effects of recent bad seasons particularly the 1944 and 1945 droughts.

BITTER PIT (physiological) has been reported on Cleopatra and Jonathan at Young (South Western Slopes) and on Willie Sharpe in the Hawkesbury River (Central Coast) district. The incidence of this trouble was generally low throughout the State.

WATER CORE (physiological) occurred in many varieties throughout the State. It appears that the prolonged wet season contributed to the widespread occurrence of this disease. It is believed that a considerable proportion of the watercore-affected fruit will recover in storage, although some losses from breakdown are anticipated in the more extensively affected fruits.

BORON DEFICIENCY. On the Norther Tablelands and elsewhere corrective measures have rendered boron deficiency troubles more or less a thing of the past. In occasional instances damage has been caused by excessive applications of borax.

LITTLE LEAF (zinc deficiency) continues to affect untreated trees on the Murrumbidgee Irrigation Areas.

SOOTY BLOTCH (Gloeodes pomigera) was recorded from the Camden-Picton-Oakdale (outer Metropolitan) area, and also from a number of orchards in coastal districts. The disease, however, was of little commercial importance, and was not evident where thorough spraying for black spot had been carried out.

FLY SPECK (Leptothyrium pomi) was found in association with sooty blotch, but its effects were not serious.

VARIEGATION (? virus) was observed throughout the State and was considerably more pronounced than last year. More trees were affected, and previously affected trees showed a high degree of mottling this season.

Again Jonathan was affected to a greater degree than any other variety. The trouble was very pronounced in the Young (South Western Slopes) district in this excellent growing season, following a severe drought year. Infected trees were growing well and carried good crops. Affected leaves frequently exhibited symptoms of scorch and spray burn not apparent to the same degree on unaffected leaves.

LEAF SCORCH (non-parasitic) was widespread, and frequently was typical of lime sulphur-lead arsenate burn. A number of growers complained of the quality of lime sulphur. Occasional hot days interspersed with the generally cool moist conditions probably contributed to the prevalence of leaf scorch.

RIPE ROT (Glomerella cingulata) occurred to a minor degree incoastal orchards, although it was more widespread than last year.

LEAF SPOT (Phyllosticta sp.) was widespread in its occurrence in spite of heavy lime sulphur spray programme applied for the control of black spot, but the degree of infection was generally slight. Unsprayed and poorly sprayed trees carried moderate infection, without serious consequence.

COLLAR ROT (Sclerotium rolfsii) was recorded on two yearling apple trees, under warm moist conditions in a nursery at Ermington, in the Metropolitan area.

HAIL. Severe hail damage was reported from the Young (South Western Slopes) district, whilst varying degrees of damage also occurred at Batlow (South Western Slopes), Orange and Hartley (Central Tableland) and on the Northern Tablelands. Hail damage, in addition to the epiphytotic of black spot, led to a still greater reduction in the grade of harvested fruit.

SPRAY RUSSET was of general occurrence this season. In some instances it was due to the application of Bordeaux Mixture too late at spur burst, i.e. into the early pinking stage, but more frequently it appeared to be due to lengthy periods of wet weather with consequent slow drying of strong concentrations of lime sulphur. Russet was also present where weak lime sulphur (1-140) cover sprays were used and appeared to be no less than where strong lime sulphur (1-80) cover sprays were used on adjacent trees.

CROWN GALL (Agrobacterium tumefaciens) occurred on Gravenstein apples in the nursery at the New England Experiment Farm at Glen Innes (Northern Tablelands).

## PEAR

BLACK SPOT (Venturia pyrina)was responsible for considerable losses in pears at Batlow (South Western Slopes), but the incidence of this disease on pear was not comparable with the severity of the attack by Venturia inaequalis on apple.

There was no record of the disease at Orange (Central Tableland), Young (South Western Slopes) or other pear growing districts in spite of the occurrence of conditions suitable for an epiphytotic. Apparently the disease was controlled very successfully by the spray programmes applied because of a low level of inoculum.

FLECK (Fabraea maculata) was recorded in slight degree on occasional trees throughout the State. It was also recorded from three nurseries at Carlingford and Ermington (Metropolitan) attacking yearling trees of imported French seedlings. The attack was severe and the growth of the trees very considerably stunted. Callaryana pear stocks and adjacent apple stocks were not affected.

WATERCORE (physiological) was evident to some degree in most pear crops, but was not as serious with pear as with apple.

ROOT ROT (Armillaria mellea) caused severe dieback in an isolated tree at Parkes (Central Western Slopes).

BORON DEFICIENCY. Remarks for apples apply also to pear.

HAIL caused a considerable amount of damage, especially in the Young (South Western Slopes) district. Damage also occurred at Batlow (South Western Slopes), Orange (Central Tableland) and the Northern Tablelands.

SPRAY RUSSET was severe on a number of pear varieties this season.

LIME INDUCED CHLOROSIS (iron deficiency) occurred in a few trees growing at Collarenebri (Central Plains).

## QUINCE

FLECK (Entomosporium maculatum) was again recorded on coastal grown quince trees. A moderate infection occurred on yearling trees in a nursery at Ermington (Metropolitan).

LIME INDUCED CHLOROSIS (iron deficiency) was recorded from an individual tree grown at Collarenebri (Central Western Plains).

INTERNAL CORK (boron deficiency) occurred at Walcha (Northern Tablelands).

## STONE FRUITS.

### ALMOND

SHOT HOLE (Clasterosporium carpophilum) occurred in epiphytotic proportions on almonds this season. In the Young (South Western Slopes) district

the most severe outbreak on record was experienced. Unsprayed crops were in many cases, a total loss. Striking control was achieved by the application of both leaf-fall and bud-swell Bordeaux Mixture sprays, especially in those orchards where this dual spray programme has been adopted for a number of years. Where either one or other of these two sprays was omitted, the degree of control was much less than that achieved where both sprays were applied. The spring spray appeared to contribute more to the control than did the autumn spray.

RUST (Puccinia pruni-spinosae) was of general occurrence but caused no extensive damage.

## APRICOT

BACTERIAL CANKER (Pseudomonas cerasi var. prunicola). This disease has again failed to manifest itself as a problem in the production of stone fruits. The vast majority of apricot trees examined in all districts showed no evidence of current season bacterial canker activity. All experiments designed to test the efficiency of control measures failed because of the extremely low level of infection.

SHOT HOLE (Clasterosporium carpophilum) was severe throughout the State this season. The large build-up of inoculum will necessitate thorough spraying at leaf fall and bud swell if control of the disease in next season's crop is to be achieved. On the Murrumbidgee Irrigation Areas the scabs flaked off the fruits before harvest, but in other inland areas, and particularly in coastal districts, the fruit was seriously scabbed. Leaf infections were not prevalent.

BROWN ROT (Sclerotinia fructicola). On the Murrumbidgee Irrigation Area, blossom and twig blighting occurred in slight to moderate degree in some orchards, and gumming and death of laterals continued for some time afterwards. Some brown rot is reported to have occurred in green apricots, but the disease did not seriously affect the fruit at the time of maturity. Late apricots in coastal districts suffered a moderate degree of infection.

FRECKLE (Cladosporium carpophilum) occurred in serious degree on coastal and some inland grown apricots, largely because of the lack of attention paid to this disease over the past few seasons, during which time the inoculum was able to build up sufficiently to cause consideralbe damage in this most favourable season. Leaf infection by this fungus was recorded from Campsie (Metropolitan Area).

INTERNAL BREAKDOWN. It has been reported that some orchardists on the Murrumbidgee Irrigation Areas suffered considerable losses, due to internal breakdown. The unusually wet season is believed to have been the predisposing factor in this loss. Specimens of internal breakdown were received from Mathoura (Riverina) and West Wyalong (South Western Slopes).

FRUIT SPLITTING (physiological) was of widespread occurrence due to the excessively wet season. Considerable losses were sustained due to infection of cracked fruit by various moulds and yeasts.

ROOT ROT (Armillaria mellea) was responsible for the death of a single apricot tree in an orchard at Orange (Central Tableland).

ZINC DEFICIENCY. Symptoms of zinc deficiency were noted on occasional trees on the Murrumbidgee Irrigation Areas.

BREAKDOWN. Fruit on the trees was affected by a breakdown somewhat resembling blossom end rot of tomatoes. The damage occurred in early apricots (Glengarry) at Glenorie and Wisemans Ferry (outer Metropolitan). A few trees only were affected. These fruits ripened during a prolonged period of excessive rains, and it is believed that the roots of the affected trees were unable to function.

SPRAY INJURY. There were several records of severe injury to apricot twigs and leaves which had been sprayed by tartar emetic spray applied for fruit fly control. Leaves were scorched and the bark was severely burned wherever the tartar emetic had accumulated. Current season samples of tartar emetic were found to contain an appreciably large percentage of arsenic, which was responsible for the injury.

## CHERRY

BACTERIAL CANKER (Pseudomonas cerasi var. prunicola) was of no consequence this season. The incidence of new infections during this wet cool winter was negligible, and extensions from old cankers had practically ceased. As with apricots, experiments designed to test the efficacy of control programmes failed because of lack of infection.

BROWN ROT (Sclerotinia fructicola) occurred in epiphytotic proportions, especially in the Orange (Central Tableland) district where the yield loss from brown rot, together with splitting of the fruit, was estimated at 75 per cent. Of the remaining fruit the majority went straight to the briner at Orange for crystallisation. Two growers in the district applied a complete spray programme and were able to market sufficient fruit to recover the costs of production. Many crops were a total loss, with the result that the inoculum of the disease in those orchards has built up enormously. Growers who applied sulphur sprays after the disease had made its appearance in their crops were unable to arrest its progress. Early cherries in the Young district (South Western Slopes) escaped infection, but late varieties on the Northern Tablelands were decimated. Blossom Blight occurred to a slight degree in the Orange (Central Tableland) district.

SHOT HOLE (Clasterosporium carpophilum) occurred throughout the State, assuming epiphytotic proportions in some localities.

CRACKING OF FRUIT. Losses of up to 80 per cent of the crop in individual instances were sustained in the Young (South Western Slopes) and Orange (Central Tableland) districts, due to the occurrence of heavy and persistent rains during final maturation period. Losses in cherry orchards on the Northern Tablelands were also heavy.

LEAF SPOT and SHOT HOLE (Cercospora circumcissa). A heavy infection by this disease occurred on nursery trees at Carlingford (Metropolitan Area.) It was also recorded from Glen Innis (Northern Tableland).

DROUGHT (during 1944 and 1946. Of approximately 1,500 acres of cherries in the Young (South Western Slopes) district prior to 1944, approximately 600 acres are now out of production. Dead trees extend over the entire area.

Trees on Kentish stock, producing small trees with shallow root systems and consequent ability to utilise the moisture from light falls of rain, have survived the drought years in much higher proportions than trees on Mazzard stock, which gives rise to a large tree with a deep root system to which light surface rains are largely unavailable. The smaller moisture requirement of trees on Kentish stock has probably been a major factor in their relatively greater survival. Many trees declined or died during the 1944 drought. The 1946 drought following without significant addition to the subsoil was devastating. Favourable seasons in 1946/47 and 1947/48 have arrested decline in drought-affected trees.

SUNSCALD has, in the past few seasons, been severe on drought-affected trees in the Young (South Western Slopes) district, particularly on trees grown on Mazzard stock.

## NECTARINE

BROWN ROT (Sclerotinia fructicola). An epiphytotic occurred in the Orange (Central Tableland) ditrict, and the disease assumed very serious proportions in most other districts. Sulphur sprays applied late in the season failed to arrest the progress of the disease. Orchardists who sprayed throughout the season achieved very indifferent control, for the trees had made such dense growth that considerable difficulty was experienced in penetrating it to cover the maturing fruit with sprays. This difficulty could largely have been overcome by the adoption of a system of light summer pruning or thinning out. In addition to facilitating the application of the sprays, this would have increased the rate of circulation of air through the trees, and consequently reduced somewhat the humidity within the trees.

The leaf and twig blighting phase of the disease was severe throughout the Orange (Central Tableland) district, and in individual cases in this and other districts, it assumed very serious proportions. In one instance at Bathurst (Central Tableland) about 60 per cent of the laterals of a few Irrewarra nectarines have been killed. Cankers were frequent on branches.

In a test plot at Orange (Central Tableland) where a nine sprays programme was adopted, there was a 15 per cent loss of fruit in the orchard, with slight additional losses in transit. This loss, although it must be compared with 50 per cent to 100 per cent loss in many other orchards, is considered to be too great in relation to the cost and time expended in the control programme.

LEAF CURL (Taphrina deformans) was prevalent on unsprayed trees in most districts, but the disease was well controlled on trees which had been thoroughly sprayed at bud-swell. Faulty spraying was well illustrated in some orchards where the tips of leaders and some laterals, which had obviously been missed by the spray, were infected by the leaf curl fungus. On unsprayed trees at Bathurst (Central Tableland) leaf infection was still occurring in January and fruit infection was severe.

FRECKLE (Cladosporium carpophilum) was of widespread occurrence but no serious loss was sustained except on unsprayed or poorly sprayed trees in coastal districts.

RUST (Puccinia pruni-spinosae) was severe on coastal trees, causing early defoliation. On inland trees, the incidence of rust was generally slight.

CROWN GALL (Agrobacterium tumefaciens). Nectarines lifted for distribution during the 1947 winter, were less severly infected than those of the previous year. At one nursery at Carlingford (Metropolitan) a small digging of Goldmine nectarines was free of crown gall.

SHRIVEL (physiological). Losses in the Orange (Central Tableland) district due to the shrivelling of the fruit just prior to maturity, were equally as severe as those due to brown rot infection, and consequently the nectarine crop in that district was largely a failure. Fruits affected by this wilting of "sleepy" condition failed to ripen. It is believed that the lateness of this cool moist season may have been a factor associated with the condition. It has been noted that a very late variety of nectarine at the Bathurst Experiment Farm (Central Tableland) has never come to maturity satisfactorily.

SHOT HOLE (Clasterosporium carpophilum) was of general occurrence, with moderate to heavy infection in some instances.

SPRAY INJURY. Trees onto which tartar emetic (bought during the current season) was splashed or sprayed, for the control of fruit fly, suffered

severe injury, amounting to complete defoliation and killing of many laterals, where trees were completely sprayed. The current season tartar emetic samples were found to contain an appreciable quantity of arsenic, which was responsible for the damage to the more delicate tissues. Severe burning of the bark occurred at lateral bases and around buds where the spray accumulated. Fruiting wood for the coming season has been seriously depleted in many instances. Fruit which were contacted by the spray were severely burned.

WATERLOGGING resulting from the almost continuous rain period during November and December was responsible for the death of a number of trees growing in the heavier soils in the Metropolitan Area, and surrounding orchard country.

SOOTY BLOTCH (Gloeodes pomigera) was recorded for the first time on nectarine from an orchard at Glenfield (outer Metropolitan). Twigs were affected.

## PEACH

BROWN ROT (Sclerotinia fructicola) occurred on peaches throughout the State, causing consistently heavy losses in coastal areas, and generally slight to moderate with occasional heavy losses in inland districts. In coastal districts a considerable amount of leaf and twig blighting occurred, sufficient in some cases materially to reduce the amount of fruiting wood for the coming season. This phase of the disease was not serious in inland districts except for occasional instances at Orange (Central Tablelands) and on early varieties at Bathurst (Central Tablelands).

In a test plot at Leeton (Murrumbidgee Irrigation Areas) where the control programme recommended by the Department was adopted, the disease was of no consequence. Similarily at Bathurst Experiment Farm (Central Tableland) the disease was not apparent in peaches which had received the early sprays and pre-harvest sprays.

In a Departmental canning peach variety trial plot at Leeton (Murrumbidgee Irrigation Areas) the earlier varieties were so seriously affected that the majority of the fruit was lost. However, losses from this disease on the Murrumbidgee Irrigation Areas were not heavy. The majority of the loss from this area reported by canning firms was due to secondary moulds, most of which developed in storage.

CROWN GALL (Agrobacterium tumefaciens). In nurseries in the Metropolitan Area, peach stocks planted in 1946, budded and lifted for distribution in May and June 1948, showed less crown gall than in those lifted in 1947. There was a high rate of mortality amongst this planting due to the dry conditions prevailing when the stocks were planted out in 1946.

In a nursery at Young (South Western Slopes) crown gall losses were serious in peaches, grown from pits sown in nursery rows in 1946, after germination in sand. The disease was infinitely more severe in the first rows which were planted. As more pits germinated they were placed out in subsequent rows, and the incidence of crown gall decreased markedly across the rows, to negligible proportions in the last rows planted out. There was no correlation with soil pH in this gradation.

The use of a mixture of 1 part of Dinoc (30 per cent sodium dinitro orthocresylate) to 4 parts of methylated spirits has proved successful in killing galls on established trees.

There is no record this season of established trees having died as a result of crown gall. This no doubt has been due to the excellent growing conditions which have prevailed in all districts.

RUST (Puccinia pruni-spinosae) assumed epiphytotic proportions in coastal districts, and by March the majority of trees were practically defoliated. Many of the earlier varieties were defoliated by mid-summer. The inoculum of this disease has been building up over the last few years and the stage was well set for the epiphytotic which occurred this season. Yearling peach trees in nurseries at Carlingford and Ermington (Metropolitan) suffered a moderate to heavy infection.

In the Murrumbidgee Irrigation Areas the incidence of rust was generally slight, but in occasional localised areas fruit of the canning varieties Golden Queen and Pullar's Cling was seriously infected. Leaf infections on these varieties were slight. In the Departmental canning peach variety trial at Leeton an early susceptible variety was heavily infected. In other inland districts rust was of general occurrence but did not reach serious proportions.

FRECKLE (Cladosporium carpophilum). Freckle infection was severe in many coastal orchards, so severe in some instances that the fruit was caused to crack due to tensions set up by the uneven growth rate of individual infected fruits.

LEAF CURL (Taphrina deformans) was generally severe on unsprayed trees, the Blackburn variety appearing to be particularly susceptible. It was noted that unsprayed trees at Glenorie showed only a trace of the disease. The efficacy of the recommended control programme was clearly demonstrated in many instances where blocks of trees had been sprayed at the correct time.

SHOT HOLE (Clasterosporium carpophilum) occurred throughout the State and moderate to heavy infection was general.

SPOILAGE. As a result of the extremely wet conditions which prevailed, expecially in coastal districts, there was a considerable amount of

splitting of stones, with resultant splitting of the fruit at the stem end. Subsequent mould growth resulted in an increased amount of fruit spoilage.

ROOT ROT (Armillaria mellea) was responsible for the death of occasional trees.

ROOT KNOT (Heterodera marioni) was recorded on a young tree growing in Hawkesbury sandstone country, beyond the Metropolitan Area.

WATERLOGGING. Following the protracted rain period during November and December, many peach orchards on the heavier soils in and beyond the Metropolitan Area were seriously depleted by an extensive mortality of trees, due to the direct effects of prolonged waterlogging.

COLLAR ROT (?Phytophthora cinnamomi) affected about 5 per cent of yearling peach trees in a nursery at Ermington (Metropolitan). The trouble occurred in a wet section of the nursery, being first noted in January after the prolonged rain period of November-December. The fungus Phytophthora cinnamomi was isolated, but with no degree of consistency. This trouble is identical with that which has caused some concern in nurseries (always associated with poorly drained situations) and in two or three year old trees in the field, over the last few years. The disease has been known locally as "peach trunk canker", from which no pathogenic organism has previously been isolated.

POWDERY MILDEW (Sphaerotheca pannosa) was recorded on fruit in the Metropolitan Area, and also from Cowra (Central Tableland).

SOOTY BLOTCH (Gloeodes pomigona) was recorded on peach for the first time from two orchards at Glenfield (Metropolitan). The current season's growth only was affected.

SPRAY INJURY. Remarks for tartar emetic injury to nectarine apply also to peach.

## PLUM

BROWN ROT (Sclerotinia fructicola) caused heavy losses in the plum crop in the Orange (Central Tableland) district, the Ponds variety being practically a total loss. The disease was making considerable headway in this highly susceptible variety a month prior to picking maturity. In the Orange district there are now vast quantities of plum, nectarine and cherry mummies as well as many peach mummies.

Infection was fairly general in the Young (South Western Slopes) district and in coastal areas. In the Hawkesbury River district the Santa Rosa variety, which had been damaged by hail, was severely attacked.

RUST (Puccinia pruni-spinosae). An epiphytotic of this disease occurred in the Orange (Central Tableland) district, and the incidence was

little less severe in the Young (South Western Slopes) district. Some plum orchards at Orange were completely defoliated in early March before the fruit had been harvested. A general infection occurred in coastal districts, but plum trees were not affected to the same degree as peach trees in this area.

BACTERIAL CANKER (Pseudomonas cerasi var. prunicola) was of no consequence this season. A block of plums at Glenorie (Metropolitan) which had previously been heavily infected, showed no evidence of current season activity of the disease.

SHOT HOLE (Clasterosporium carpophilum) was of widespread occurrence, being particularly severe on Japanese varieties in the Orange (Central Tableland) and Young (South Western Slope) districts, as well as on coastal grown plums. Fruit infections were common. European varieties were not affected to the same degree. Infection was severe in some instances on the Murrumbidgee Irrigation Areas.

SHOT HOLE (Phyllosticta prunicola). This organism was responsible for much of the leaf spot and shot hole which occurred in the Orange (Central Tableland) district.

CROWN GALL (Agrobacterium tumefaciens). The 1947 digging of plums grown from cuttings in a nursery in the Metropolitan Area yielded approximately 40 per cent crown gall infected trees.

PLUM POCKETS (Taphrina pruni) was recorded from Mittagong (Southern Tablelands) on the Burbank variety.

SCALD (physiological) was prevalent on the Wilson variety in the Metropolitan Area following a brief period of scorching westerly winds in October.

BLACK SPOT (Xanthomonas pruni) was recorded from Tathra on the South Coast.

SUSPECTED VIRUS. In an orchard on the Upper Colo River (Central Tableland) several trees in a block of blood plums were worked over last spring with Santa Rosa as pollinators. On one tree the leaves on some of the new shoots of both Santa Rosa and blood plum showed patterns suggestive of virus.

## TROPICAL FRUITS

### AVOCADO PEAR

ROOT ROT (Phytophthora cinnamomi) was recorded in August for the first time from Grafton (North Coast). The variety affected was Mexican Seedling (grafted trees). The autumn 1947 was very wet in this district.

## BANANA

BUNCHY TOP (virus). Records compiled by the Division of Horticulture show that in spite of a substantial increase in acreage the incidence of this disease was lower than in the previous year. The detection service maintained by the Banana Growers' Federation in co-operation with the Department of Agriculture, revealed 4 plants per 100 acres in 1947/48. Greatest improvement occurred in the Tweed (North Coast) district, where the rate for this year was 5 per 100 acres inspected compared with 13 per 100 acres and 12 per 100 acres during the preceding two years. A thorough inspection in the autumn of 1948 revealed no further disease in the Clarence or Yarrahappini (North Coast) eradication zones. Last record for Yarrahippini was on 10/4/1947.

LEAF SPOT (Cercospora musae) again caused heavy losses in the Tweed and Brunswick (North Coast) districts, very few growers having yet adopted protective spraying. Good control of the disease was again obtained by spraying with Bordeaux Mixture (plus colloidal sulphur for Speckle control) at the experimental plots at Duranbah (North Coast) in a season highly favourable for infection.

ROOT ROT (Rhizoctonia solani) was responsible for the collapse of portion of a plantation in the Brunswick (North Coast) district in the late autumn. Soil from the affected area of the plantation had a reaction of pH 6.5, an unusually high reading for this part of the State.

LEAF FALL (nutritional). This disease caused heavy losses in two plantations at Bangalow established on old grassland in 1946. Neither of the plantations had been fertilized.

SQUIRTER (Nigrospora sphaerica) was again common in fruit consigned to the Sydney, Melbourne and Adelaide markets. The disease has been proclaimed under the New South Wales Plant Diseases Act, and regulations are pending requiring treatment of fruit after packing in dilute salicylanilide or its sodium salt, before sale in New South Wales. Legislation against this disease has already been introduced in Western Australia requiring fruit entering that State to be treated as above.

## MANGO

ANTHRACNOSE (Gloeosporium gloeosporioides) occurred in December in many parts of the far North Coast and at Grafton (North Coast). Frequent rains occurred in November. Infection was present on young fruits, twigs and foliage.

## PAPAW

CRINKLE (virus). This disease was general in most plantings in North Coast districts. In April and May the association of die-back of the terminal

buds with crinkle sumptoms of the foliage was noted at Duranbah (North Coast).

POWDERY MILDEW (Oidium sp.). Following a period of wet weather in April and May, this disease was present in most plantings on the far North Coast, attacking the young central foliage and giving a bold mosaic-like pattern to the leaves.

## PASSION FRUIT

BROWN SPOT (Alternaria passiflorae). Losses from this disease were heavy during the summer and autumn in unsprayed plantations. Some plantations on the far North Coast were defoliated by the disease.

LEAF and FRUIT SPOT (Septoria sp.). Premature falling of mature leaves and immature fruit from unsprayed vines attracted attention during the early summer in the Metropolitan Area, and on the far North Coast. The fungus Septoria sp. was associated with round spots which occurred on both the leaves and fruit. Inoculation under glasshouse conditions during the autumn established pathogenicity of the fungus. Perithecia of Mycosphaerella appeared in old lesions on fruit kept in a moist chamber and ascospores from these gave rise to cultures of Septoria.

WOODINESS (virus). The relatively cool summer resulted in this virus being generally less masked, and woody symptoms were more prominent than usual in the summer crop. Woodiness disease is still a serious problem in the industry by shortening the productive life of plantations.

## PINEAPPLE

WILT (cause undet.). This disease was present in most two year old and older plantings in far North Coast districts.

## MISCELLANEOUS FRUITS

### FIG

LEAF SPOT (Cercospora fici) was recorded from a number of localities in the Metropolitan Area and from Byron Bay (North Coast). The cool wet conditions of spring and early summer appeared to be conducive to its development.

LEAF BLOTCH (Phyllosticta sycophyla) was recorded from several central and north coast localities.

RUST (Kuehneola fici) was recorded for the first time in New South Wales from Byron Bay (North Coast).

SOURING (yeasts etc.) was prevalent in fig crops in the Murrumbidgee Irrigation Area, and was recorded also from the Metropolitan Area and from Grenfell (South Western Slopes). The dried-fruit weevil appeared to be the agency causing spread to unopened figs.

## GRAPES

DOWNY MILDEW (Plasmopara viticola) occurred throughout the State, and losses were heavier than for many years. From late spring until early January the weather was cool and wet, even in western parts of the State where high temperatures and low humidities are normally experienced from October onwards. Downy mildew appeared in early summer and by mid-December had assumed epiphytotic proportions in coastal vineyards, and soon afterwards similar reports were received from Tableland and Western Slopes districts. On the Coast and Tablelands regular spraying was often not possible because of the combined bad weather, and consequently control was in many cases ineffective. Vineyards in the Hunter River, (Central Coast) Liverpool (Metropolitan), Orange-Molong-Borenore (Central Tableland), Young and Albury (South Western Slopes) districts suffered severely. Downy mildew was also reported as having ruined the crops of susceptible varieties at Parkes, Forbes and Dubbo (Central Western Slopes), where spraying is usually not necessary. It also occurred at Moree, Wee Waa and Baradine (North Central Plains) where it had never previously been recorded.

Downy mildew also appeared in Murrumbidgee Irrigation Areas and mid-Murray vineyards in early summer, but most growers were able to spray regularly and control was reasonably good. A sudden spell of hot dry weather in January checked the spread. Several minor outbreaks were reported in irrigation districts on the lower Murray, but hot conditions in January checked these also.

BLACK SPOT (Elsinoe ampelina). Though not so serious or so widespread as downy mildew in most sections, this disease was present and caused considerable injury in the Hunter River (Central Coast), Orange and Molong (Central Tableland), Young, Forbes and Albury (South Western Tableland) districts, especially where Bordeaux sprays were not applied at regular intervals. It also occurred on unsprayed vines at Griffith (Murrumbidgee Irrigation Areas) but though present on sprayed vines in the Murrumbidgee Irrigation Areas and middle and lower Murray, its development was satisfactorily controlled. At Koraleigh (lower Murray) where a week of wet weather was experienced within a few days of petal fall, few growers were able to spray and 30 per cent of the sultana crop was spoiled.

POWDERY MILDEW (Uncinula necator). As usual, this disease occurred on sultanas in lower Murray vineyards, but though early indications were serious, it did not develop as expected, probably

because of hot January weather. A little loss of fruit and lowering in grade of sultanas was noted.

MOSAIC (? virus). A mosaic condition occurred on early formed leaves of sultana and Gordo Blanco in some lower Murray vineyards. On severely affected vines the flowers dropped badly and fruit set was very poor. If this is a virus condition it appears likely that its effects have been accentuated by the unusually cool spring weather. A similar but less severe mosaic was noted on summer formed leaves of Doradillo and Pedro Ximenis in some Griffith (Murrumbidgee Irrigation Areas) vineyards. In blocks where it occurred every vine showed a similar condition.

? PIERCES DISEASE (? virus). Symptoms very suggestive of this disease were seen in a block of Hunter River Reisling grapes in the Cessnock (Central Coast) area. The condition is under investigation.

STUNT (? virus). This condition which was observed in a block of Black Shiraz grapes at Yenda (Murrumbidgee Irrigation Areas) last season appears to be spreading, but so far is restricted to the one block. Cut back vines died out or made only weak growth.

FRUIT DROP (seasonal). Poor fruit set was reported from a number of centres, due to wet cold weather at blossoming.

LEAF SCALD (seasonal). The sudden onset of hot conditions in January caused considerable scalding of foliage, particularly in the Hunter River (Central Coast) and Orange-Molong-Borenore (Central Tableland) districts. In Murrumbidgee Irrigation Areas and lower Murray vineyards a purplish-bronze discolouration of exposed foliage was rather common.

## LOQUAT

No record.

## MULBERRY

LEAF SPOT (Septogloeum mori) was widespread in its occurrence, very heavy infections being common.

BACTERIAL BLIGHT (Pseudomonas mori) was prevalent and severe infections were recorded frequently.

## OLIVE

LEAF SPOT (Cycloconium oleaginum) was recorded for the first time in New South Wales at Ryde and Cornwallis and in the Parramatta (Metropolitan) districts. Almost complete defoliation occurred in early spring, and following cool wet spring and summer

weather, spring-formed leaves were heavily infected and further leaf fall occurred. Monthly application of copper oxychloride-white oil spray held the disease in check, but did not control it completely. Probably under more normal weather conditions control could be achieved with relatively few well-timed sprays.

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time in New South Wales on this host at Ryde (Metropolitan Area). Affected trees were unthrifty in appearance, the foliage yellow and not dense. The trees were growing in heavy soil in a position where drainage water accumulated.

## PERSIMMON

LEAF SPOT (Gloeosporium diospyri) was common throughout the Metropolitan Area, severe defoliation occurring in many instances.

## STRAWBERRIES

CRINKLE (virus) continues to be a limiting factor in strawberry production in New South Wales.

LEAF DISEASES. SPOT (Mycosphaerella fragariae), SCORCH (Diplocarpon earliana) and BLIGHT (Dendrophoma obscurans) were prevalent on susceptible varieties during late spring. The varieties Phenomenal, Fendalcino and Cresswell Seedling appear to be very much more resistant to all these diseases than Richmond Red and King Edward. Leaf spot was particularly heavy on a Richmond Red crop at Batlow (South Western Slopes).

ROOT ROT (Rhizoctonia solani) was responsible for the failure of crops at Kenthurst and Pendle Hill (outer Metropolitan) and was recorded causing slight losses in other Metropolitan districts, in the North Coast and Narrabri (North Central Plains). At the Bathurst Experiment Farm (Central Tableland) the Cresswell Seedling variety was much more severely affected than other varieties.

## WALNUT

BACTERIAL BLIGHT (Xanthomonas juglandis) was of widespread occurrence, being particularly severe on the Northern and Southern Tablelands, where heavy crop losses were sustained.

ANTHRACNOSE (Glomerella cingulata) was recorded at Armidale (Northern Tableland).

## ORNAMENTALS

### ACACIA DECURRENS (Golden Wattle)

DIE BACK (Verticillium dahliae) was recorded for the first time on this host from a Metropolitan garden.

### ANTIRRHINUM

SHOT HOLE BLIGHT (Heteropatella antirrhini) was recorded for the first time in New South Wales from a number of flower farms and private gardens in the Metropolitan Area, and from Young (South Western Slopes) and Long Jetty (Central Coast). Prolonged cool wet weather in late spring and early summer favoured the spread of the fungus, which promises to become the most serious, affecting this crop in coastal New South Wales. Further outbreaks occurred during autumn and winter.

COLLAR ROT (Rhizoctonia solani and Phytophthora spp.) were prevalent during late spring and summer.

ANTHRACNOSE (Colletotrichum antirrhini) caused losses during late spring, especially to seedling crops in the Wyong (Central Coast), Mt. Colah and Carlingford (Metropolitan) districts.

WILT (Verticillium dahliae) was responsible for heavy losses in several Metropolitan srping crops.

DOWNY MILDEW (Peronospora antirrhini) was recorded from a number of Metropolitan nurseries.

ROOT KNOT (Heterodera marioni) was prevalent, as usual.

### AQUILEGIA

CROWN ROT (Sclerotium rolfsii) was recorded from the Metropolitan area.

### ASTER

GREENING (? Big Bud virus) was unusually prevalent in late spring and occurred in parts of the Metropolitan area where previously little or none had been observed. Losses of up to 80 per cent were recorded. It was common also in country districts.

WILT (Fusarium callistephi) was recorded in a crop at Milperra (Metropolitan Area) causing about 15 per cent loss.

STUNT (? Rhizoctonia solani). Many early planted crops in the Metropolitan Area made very poor growth in the seed bed and when planted out. Cold spring weather and a rootlet rot with which Rhizoctonia solani was associated, are believed to be the cause.

## AZALEA

LEAF GALL (Exobasidium vacinii) was prevalent during the spring on susceptible varieties.

CHLOROSIS (insufficiently acid soil) was recorded from a number of Metropolitan nurseries and home gardens.

DAMPING OFF (Rhizoctonia solani) caused heavy losses of young rooted cuttings in a Kurrajong (Central Tableland) nursery.

## BIRCH

LEAF SPOTS (Gloeosporium betularum and Cylindrosporium betulae) were recorded for the first time in New South Wales from Moss Vale (Southern Tableland), Leura and Kurrajong (Central Tableland) and the Metropolitan Area. Undoubtedly these fungi have been present unnoticed for many years, but the unusually prolonged cool wet weather of spring and early summer favoured their development and very heavy infection occurred. Trees in these areas were almost defoliated by mid-February.

RUST (Melampsoridium betulae) was recorded for the first time in New South Wales from Leura (Central Tableland).

## BEGONIA

ROOT KNOT (Heterodera marioni) was recorded from the Metropolitan Area.

## CALENDULA

RUST (Puccinia distincta) was very prevalent, as usual.

## CALLA

SPOTTED WILT (virus) was recorded from the Metropolitan Area.

SOFT ROT (Pseudomonas aroideae) was recorded from several nursery crops in the Metropolitan Area. Hot water treatment ( 1 hour at 55°C) completely eliminated a deep seated infection without injury to the corm.

## CAMELLIA

CANKER (Glomerella cingulata) was recorded from a Metropolitan nursery.

VIRUS (? spotted wilt) is widespread but causes little apparent loss of vigour.

CHLOROSIS (alkaline soil) was recorded from a number of localities.

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time in New South Wales on Camellia magnoliaeflora in a Metropolitan nursery. Potting soil in use there had a pH value of 7.0.

## CARNATION

COLLAR ROTS. Rhizoctonia solani was the principal cause of collar rotting during summer, a number of heavy losses being recorded in Metropolitan and country districts. Sclerotium rolfsii was also recorded from a number of localities during January and February.

ROOT KNOT (Heterodera marioni) was prevalent, as usual.

MOSAIC (virus) was prevalent as usual.

LEAF SPOT (Septoria dianthi) and RUST (Uromyces caryophyllinus) were prevalent throughout the year.

LEAF SPOT and BRANCH DIE-BACK (Alternaria dianthi) was recorded during spring and summer from several Metropolitan flower farms and nurseries. Where the disease becomes established, it appears to cause more damage than Septoria spot or rust. Spots at first are small and appear on the young leaves, the older leaves dying off prematurely. The disease is not at present widely distributed.

LEAF AND STEM SPOT (Heterosporium echinatum) was recorded from several localities during early spring, but caused little damage.

## CERATOSTIGMA

PROLIFERATION (? virus) was recorded from a Metropolitan garden. New growth made after cutting back was normal except for a slight leaf mottle on a few branches.

## CHAMAELAUCIUM UNCINATUM

ROOT ROT (Phytophthora cinnamomi) caused losses to nursery stock during spring and summer.

SHOOT BLIGHT (Botrytis cinerea) was reported to be causing severe damage in a Metropolitan nursery during spring 1947.

## CHRYSANTHEMUM

LEAF NEMATODE (Aphelenchoides ritzema-bosi) was again the most serious disease of this crop. A total or partial loss of susceptible varieties occurred.

The disease is disseminated by nurserymen in this State and Victoria.

RUST and LEAF SPOT (Puccinia chrysanthemi and Gylindrosporium chrysanthemi) were very prevalent following cool moist spring and summer weather.

VERTICILLIUM WILT (Verticillium dahliae). Several records.

STUNT (Virus). Several records.

GREENING (? Big Bud virus) was recorded from the Metropolitan Area for the first time on this host in New South Wales.

## CINERARIA

SCALD (Verticillium dahliae) was recorded for the first time on this host in New South Wales, on a Metropolitan seed crop.

RUST (Puccinia distincta). Cross inoculation proved that the species affecting this host is identical with that common on Calendula and English Daisy. There were several records from Metropolitan gardens.

## CLIVEA MINIATA

LEAF SCORCH (Stagonospora curtisii) was recorded for the first time in New South Wales on this host, causing considerable damage to foliage of plants in the Sydney Botanic Gardens. Its spread was favoured by the cool wet spring and summer weather.

## CRINUM

RED STRIPE (Stagonospora curtisii) was recorded for the first time in New South Wales on this host from several Metropolitan gardens, causing considerable damage to foliage.

## CUPRESSUS spp.

DIE BACK (probably root rot, but cause not ascertained) was prevalent in the Metropolitan Area.

## CYMBIDIUM sp.

MOSAIC (virus) was fairly prevalent as usual. Hot water treatment (50°C for periods of ½ to 5 hours) was not effective in eliminating the infection from pseudo bulbs.

BULB ROT (Sclerotium rolfsii) was recorded for the first time on this host in New South Wales from a Metropolitan garden.

## DAFFODIL

BASAL ROT (Fusarium bulbigenum) was recorded from a number of Metropolitan and Mountain crops, causing losses of up to 80 per cent.

NEMATODE (Anguillulina dipsaci) was recorded from several Mountain localities.

MOSAIC (virus) was present in a severe form in crops of daffodil and jonquil at Kurrajong, Bilpin (Central Tableland) and Robertson (South Coast).

SCORCH (Stagonospora curtisii) was recorded for the first time in New South Wales from the Robertson (South Coast) district on plants grown from bulbs imported from Holland. Damage was not severe.

BULB ROT (Armillaria mellea) was recorded for the first time on this host in New South Wales from a Kurrajong (Central Tableland) flower farm.

## DAHLIA

POWDERY MILDEW (Oidium sp.) was prevalent as usual during late autumn, but caused no significant damage.

LEAF SPOT (Entyloma dahliae) was reported from St. Ives (Metropolitan) and Leura (Central Tableland).

SPOTTED WILT (virus) was prevalent as usual.

MOSAIC (? cucumber mosaic) causing stunting and leaf distortion in early crops was recorded from several localities.

ROOT KNOT (Heterodera marioni) recorded from a Metropolitan crop.

## DAISY, ENGLISH

RUST (Puccinia distincta) was recorded from several Metropolitan localities.

## DAPHNE

COLLAR ROT (Phytophthora parasitica and Sclerotium rolfsii) was prevalent in Metropolitan gardens following excessive spring and summer rains.

MOSAIC (virus) was prevalent as usual on D.indica.

CHLOROSIS (soil not sufficiently acid) was recorded from a number of Metropolitan localities.

## DELPHINIUM

BACTERIAL SPOT (Pseudomonas delphinii) caused moderate damage at Batlow (South Western Slopes) and Liverpool (outer Metropolitan).

GREENING (Big Bud virus) was recorded from a Metropolitan garden.

## ELM (Ulmus campestris)

LEAF SPOT (Septogloeum ulmi) was recorded for the first time in New South Wales from Sutton Forest and Moss Vale (Southern Tablelands), causing some premature defoliation.

## EMBOTHRIUM

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on this host, causing heavy mortality to nursery stock during spring rains.

## EUCALYPTUS spp.

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on this host causing mortality to nursery stock during spring rains.

## EUONYMUS

POWDERY MILDEW (Oidium euonymi-japonici) was recorded causing considerable damage at Bowral (Southern Tableland).

## FRANGIPANNI

POWDERY MILDEW (Oidium sp.) was prevalent in Metropolitan gardens during the spring, causing some distortion of young leaves.

## FREESIA

SCAB (Pseudomonas marginata) was recorded from a Metropolitan crop.

DRY ROT (Sclerotinia gladioli) was recorded for the first time on this host from a Metropolitan nursery.

## GARDENIA

ROOT ROT (Heterodera marioni) was prevalent as usual.

CHLOROSIS (soil not sufficiently acid) was recorded from a number of Metropolitan localities.

BUD DROP (nutritional) was prevalent in the Metropolitan Area.

LEAF YELLOWING (? potassium deficiency) was recorded from a number of Metropolitan gardens.

## GERANIUM

RUST (Puccinia pelargonii-zonalis) was prevalent throughout the year on susceptible varieties on the Coast and Tablelands.

## GERBERA

CROWN ROT (Phytophthora sp.) caused heavy losses in some Metropolitan localities.

LEAF SPOTS (Cercospora sp. and Septoria sp.) were very prevalent following wet conditions in spring and summer.

GREENING (? Big Bud virus). There were a large number of records from Metropolitan and country districts.

## GLADIOLUS

NECK ROT and DRY ROT (Sclerotinia gladioli) were again very important as a source of loss, and were reported from crops in all parts of the State.

CORE ROT, LEAF and FLOWER SPOTTING (Botrytis cinerea). Spring and late autumn crops, especially in Tableland districts, suffered severe leaf infection and flower spotting during cool wet weather. Heavy losses from corm rot occurred in central and south coast crops and in crops at Robertson (South Coast), Mount Wilson and Kurrajong (Central Tablelands), Bundanoon (Southern Tablelands) and Bathurst (Central Tableland) and elsewhere.

SCAB (Pseudomonas marginata) was fairly general.

HARD ROT (Septoria gladioli) was reported from Liverpool, St. Ives and a number of other Metropolitan localities, and from Bathurst (Central Tableland).

MOSAIC (virus) was observed in several Metropolitan crops.

## HIPPEASTRUM

RED STRIPE (Stagonospora curtisii) was recorded for the first time on this host in New South Wales from Lismore (North Coast) and the Metropolitan Area.

## HOLLY

LEAF SPOT (Guignardia citricarpa) was recorded for the first time on this host from Kurrajong (Central Tableland).

## HOLLYHOCK

RUST (Puccinia malvacearum) was prevalent, as usual.

## HOLMSKYOLDIA

ROOT ROT (Phytophthora sp.) caused heavy losses to nursery stock during the spring.

## HYACINTH

NEMATODE (Anguillulina dipsaci). There were several records from Mountain and Metropolitan crops.

SOFT ROT (Bacterium carotovorum) caused slight loss in a Bathurst (Central Tablelands) crop.

## HYDRANGEA

POWDERY MILDEW (Oidium sp.) was fairly general though it caused little damage.

CHLOROSIS (soil not sufficiently acid). There were several records from Metropolitan localities.

## IPOMOPSIS

SPOTTED WILT (virus) caused 10 per cent loss in a crop at Mount Colah (Metropolitan).

COLLAR ROT (Rhizoctonia solani). Cool wet conditions in early summer favoured the development of this disease, causing a 15 per cent loss in a Metropolitan crop.

## IRIS

LEAF SPOT (Heterosporium gracile) was recorded from many Metropolitan and Mountain (Central Tableland) localities in the spring, causing slight to moderate damage to German iris.

NECK ROT (Rhizoctonia solani) was recorded for the first time on Dutch iris in New South Wales at Narara (Central Coast) and Wahroonga (Metropolitan).

RHIZOME ROT (Phytophthora sp.) was recorded for the first time on German iris, causing heavy mortality to home garden crops in two Metropolitan localities.

## JACARANDA

COLLAR ROT (Phytophthora cinnamomi) was recorded on young trees at Falls Creek (South Coast).

## KURRAJONG

ROOT ROT (Phytophthora parasitica) continues to cause death of street and breakwind trees in the Murrumbidgee Irrigation Areas.

## LAGERSTROEMIA

POWDERY MILDEW (Uncinula australiana) was very widespread during late spring.

## LARKSPUR

ROOT ROT (Rhizoctonia solani) caused almost complete failure of a crop at Mount Colah (Metropolitan) during early spring.

POWDERY MILDEW (Erysiphe polygoni). There were a number of records from Metropolitan crops.

## LILAC

BLIGHT (Pseudomonas syringae) caused considerable injury to flowers, shoots and leaves at Batlow (South Western Slopes) and Mount Tomah (Central Tablelands).

## LILY

MOSAIC (virus) was widespread in commercial crops and home gardens.

ROOT and BASAL STEM ROT (Phytophthora cinnamomi) was recorded for the first time on this host in New South Wales, causing heavy mortality among flowering plants of L.philippense at Wyong (Central Coast) and in a Metropolitan garden.

BULB SCALE ROT (Rhizoctonia solani) was recorded causing severe damage to bulbs of a number of species in a Metropolitan crop.

## LIME (TILIA)

LEAF SPOT (Cercospora microsora) was recorded at Moss Vale, Sutton Forest (Southern Tableland) and Mount Wilson (Central Tableland).

EPACRIS MICROPHYLLA and E.PULCHELLA

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on these hosts from Kuringai Chase (Metropolitan Area).

ERIOSTEMON CROWEI

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on this host from Kuringai Chase (Metropolitan Area).

GRAPE, WILD (VITIS HYPOGLAUCA)

DOWNY MILDEW (Plasmopara viticola) was recorded for the first time on this host from Kuringai Chase (Metropolitan Area), causing considerable damage to young foliage following prolonged cool wet weather in early spring.

KENNEDYA RUBICUNDA

LEAF SPOT (Cercospora Kennedyae) was recorded for the first time in New South Wales on this host from Lindfield and Palm Beach (Metropolitan Area).

LEUCOPOGON MICROPHYLLUS

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on this host from Kuringai Chase (Metropolitan Area).

MALVA

RUST (Puccinia malvacearum) was widespread.

MICRANTHIUM ERICOIDES

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on this host from Palm Beach (Metropolitan Area).

MUSTARD, WILD

LEAF and STEM SPOT (Alternaria sp.) was observed causing heavy infection in the Wagga district (South Western Slopes) following cool damp spring weather.

PHYLLOTA PHYLICOIDES

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on this host from French's Forest (Metropolitan Area).

## PINUS RADIATA

ROOT ROT (Phytophthora cinnamomi) caused losses amongst nursery trees in several Metropolitan nurseries.

DYING OUT (cause not known). In January following wet spring and summer conditions, trees in the Gosford-Wyong (Central Coast) and Windsor, Richmond and Hills (outer Metropolitan) districts died back suddenly and many died right out. Trees of all ages were affected. Diplodia pini was associated and caused considerable twig death in spring and autumn, but is not the primary cause of the unhealthy condition.

## PLANE

DIE BACK (Gnomonia veneta). Cool wet spring and summer weather favoured this disease, which caused twig die-back to street and garden trees at Batlow (South Western Slopes), Forbes (Central Western Slopes), Cowra (Central Tableland), Narrandera (Riverina), Moss Vale (Southern Tableland) and the Blue Mountains (Central Tableland).

## POINSETTIA

DIE BACK (Phomopsis sp.) was reported to be causing the gradual death of trees at Pymble (Metropolitan Area).

## POLYANTHUS

LEAF SPOT (Ramularia primulae) was recorded from Emmaville and Armidale (Northern Tableland).

## POMEGRANATE

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on this host in New South Wales from a Metropolitan nursery, on seedling stock.

## POPLAR

LEAF SPOT (Taphrina aurea) was reported from Batlow (South Western Slopes) and Oberon (Central Tableland).

CHLOROSIS (very alkaline soil) was recorded from Narrabri (North Central Plain).

## POPPY, ICELAND

SPOTTED WILT (virus) was fairly general in spring 1947 in Metropolitan and country districts, but losses were mostly light.

DOWNY MILDEW (Peronospora arborescens) was fairly general in spring 1947.

## PRIMULA

SPOTTED WILT (virus) was recorded from the Metropolitan area.

## PYRACANTHA COCCINEA var. LALNADEI

BLACK SPOT (Fusicladium pyracanthae). Heavy infection was reported from Tableland districts and Carlingford (Metropolitan Area).

## PYRETHRUM

COLLAR ROT (Rhizoctonia solani) was recorded from the Metropolitan Area.

## RANUNCULUS

MOSAIC (virus) was reported from several Metropolitan crops. Hot water treatment of tubers (50°C for ½ to 3 hours) did not eliminate infection.

## ROCKLILY

LEAF SPOT (Guignardia citricarpa) was recorded from the Metropolitan Area.

## ROSE

POWDERY MILDEW (Sphaerotheca pannosa) was very general on the Coast and Tablelands during summer and caused considerable damage.

BLACK SPOT (Diplocarpon rosae) was very severe in late spring and again in the autumn, causing much premature defoliation. As the result of continued defoliation, die-back of susceptible varieties (mostly Pernettiana types) caused heavy losses to some Metropolitan nurserymen.

DIE BACK (Coniothyrium fuckelii associated) was recorded from the Coast and Tablelands.

ANTHRACNOSE (Sphaceloma rosarum) was recorded from Coast and Tablelands.

BLACK MOULD (Chalaropsis thielavioides) was recorded for the first time in New South Wales, though the disease appears to have been present for many years. Stock cuttings are attacked at the cut ends or through wounds. In a survey of Metropolitan rose nurseries during spring and summer losses of from 5 to 95 per cent were observed. Noisette stock was found to be very susceptible, thorny Multiflora slightly susceptible and thornless multiflora resistant. This disease appears to be the main reason for the failing popularity of the Noisette stock.

DIE BACK (Verticillium dahliae) was recorded for the first time on this host in New South Wales, causing a die-back of canes of budded Multiflora stocks in a Metropolitan nursery. Losses were very slight.

## SALPIGLOSSUS

SPOTTED WILT (virus) caused 10 per cent loss in a crop at Mount Colah (Metropolitan Area).

## SALVIA SPENDENS

GREENING (? Big Bud virus) was recorded for the first time on this host from Grafton (North Coast).

## SCHIZANTHUS

POWDERY MILDEW (Oidium sp.) was recorded from a Metropolitan locality.

## SHASTA DAISY

LEAF SPOT (Septoria leucanthema) caused very heavy damage to foliage in a crop at Mount Tomah (Central Tableland).

GREENING (? Big Bud virus) was recorded from several Metropolitan localities.

## STATICE

SPOTTED WILT (virus) was recorded from Wyong (Central Coast) Liverpool and Smithfield (outer Metropolitan). The primary reaction is severe, resulting in a die-back, but the plants make a partial recovery and grow fairly vigourously, but the flowers are not suitable for market.

## STOCK

BLACK ROT (Xanthomonas incanae) again was the most serious disease of stocks in New South Wales and records of losses of from 5 to 90 per cent were received from many parts of the State. As usual, early planted crops suffered most severely. Hot water treatment of the seeds (10 minutes at 56-57°C) when used gave satisfactory control in most cases.

MOSAIC (virus) was reported from several country and Metropolitan centres.

ROOT ROT (Rhizoctonia solani) was recorded from a Metropolitan locality.

SCLEROTINIA ROT (Sclerotinia sclerotiorum) caused about 1 per cent loss in a crop at Bonny Rig (outer Metropolitan).

## SWEET PEA

ROOT ROT (*Pythium* sp., *Rhizoctonia solani*, *Fusarium* sp.) was recorded from Metropolitan and country centres during spring 1947 and autumn 1948.

BUD DROP (excess nitrogen) was rather prevalent during spring 1947.

LEAF SPOT (*Glomerella cingulata*) was recorded from Murwillumbah (North Coast) and Berowra (Metropolitan Area).

## SWEET WILLIAM

COLLAR ROT (*Sclerotium rolfsii*) was recorded during the summer from Metropolitan gardens.

## TAMARIX APHYLLA

ROOT KNOT (*Heterodera marioni*) was recorded for the first time on this host in New South Wales from the Metropolitan Area.

## VERONICA

LEAF SPOT (*Septoria* sp.) was recorded from the Metropolitan Area.

## VIOLET

SCAB (*Sphaceloma violae*) was severe in Metropolitan crops during spring 1947 and autumn 1948.

## WILLOW (*Salix babylonica*)

LEAF SPOT (*Marssonina saliciperda*) was recorded from Armidale (Northern Tableland).

## ZINNIA

LEAF SPOT (*Alternaria zinniae*) was recorded on young plants at Mount Colah (Metropolitan) in spring 1947. Some varieties showed considerable resistance, while others were severely blighted. It was fairly general on old plants towards the end of the season, but caused little damage.

POWDERY MILDEW (*Oidium* sp.) was very general towards the end of the season.

SPOTTED WILT (virus) caused little loss this season.

COLLAR ROT (*Rhizoctonia solani*), caused losses amongst some Metropolitan crops.

## VEGETABLES

### ASPARAGUS

SHOOT CANKER (Fusarium sp. associated). Asparagus shoot showing cankers on the developing shoots and with which a species of Fusarium was associated, were submitted from Cowra (Central Tablelands).

### BEAN

BACTERIAL DISEASES. HALO BLIGHT (Pseudomonas medicaginis var. phaseolicola). The seed certification scheme has continued to give satisfactory control of this disease. In certification inspections of seed crops on the South Coast, 18 crops out of a total of 148 crops were rejected because of the presence of halo blight (an additional 62 crops were rejected for other reasons). In almost all cases infection was light - one small patch of a few plants in several acres.

Three cases of severe infection were recorded in green bean crops. AMERICAN COMMON BLIGHT (Xanthomonas phaseoli) was recorded in the case of beans other than navy beans (see separate section) only in one seed crop of the Epicure variety, two green bean crops of Brown Beauty and small plots grown for seed increase of the varieties Richmond Wonder and Gelman Runner. BACTERIAL BROWN SPOT (Pseudomonas syringae) was much more prevalent than in the previous year. This higher incidence of the disease was associated with a wetter season than that of the preceding summer and weather conditions were favourable for development and spread.

The seed certification scheme was continued for the fifth successive season. A total of 762 acres (148 separate crops) were inspected and 365 acres (68 crops) were passed for certification. It is expected that about 4,500 bushels of seed will be certified. About 65 per cent of this will be Brown Beauty, 33 per cent Hawkesbury Wonder and the remaining 2 per cent will consist of Tweed Wonder, Wellington Wonder and Clarendon Wonder.

ANGULAR LEAF SPOT (Isariopsis griseola). This disease was widespread and responsible for serious leaf damage in most crops of dwarf French beans, many crops showing 100 per cent infection. Wet conditions in the summer months apparently favoured spread of the disease. In the absence of other satisfactory means of control, there is a definite need for a dwarf French bean variety resistant to this disease. Field observations indicate that most of the climbing varieties are resistant.

MOSAIC (virus) was present in all crops inspected. One crop of the Brown Beauty variety was observed in the Sydney Metropolitan Area in

which 15 to 20 per cent of the plants showed symptoms not quite typical of those of the common bean mosaic. From photographs of the specimens, Mr. L.L. Stubbs of the Victorian Department of Agriculture, considered that the disease appeared to be the same as a virus disease of beans which he is investigating in Victoria, and which he considers is probably the American yellow bean mosaic (not seed transmitted).

MOTTLE LEAF (non-parasitic). The condition in Tweed Wonder and Canadian Wonder crops which in previous surveys has been recorded as "yellow dwarf mosaic" is now thought to be an hereditary abnormality similar to that to which the name "mottle leaf" has been applied in the United States. It appears to be due to recessive factors as very thorough mass field roguings have not eliminated the condition from the seed in the case of Tweed Wonder seed crops. Work has been initiated to build up supplies of Tweed Wonder seed free from this condition from single plant selections.

ANTHRACNOSE (Colletotrichum lindemuthianum). Very wet conditions experienced during the summer months favoured the development and spread of anthracnose which was much more in evidence than for some years past. Anthracnose was responsible for more rejections in the case of seed crops submitted for certification than any other single factor. Out of a total of 80 crops rejected, 30 were rejected because of the presence of this disease. In comparison, during the preceding season (1946/47) anthracnose was responsible for only 4 rejections out of a total of 83 crops rejected. Two Canadian Wonder seed crops at Eurobodalla (South Coast) were complete failures as a result of anthracnose, whilst very severe infection was also recorded on Startler Wax beans. The disease was recorded in 18 crops of Brown Beauty and 4 crops of Hawkesbury Wonder grown from certified seed. In the preceding three years, anthracnose had been seen only once in a seed crop of these two varieties grown from certified seed in a crop of Brown Beauty in the 1945/46 season. It is not known whether the occurrence of the disease in crops grown from certified seed represents trace seed carry-over during several drier preceding seasons or whether infection resulted from some other source such as seed cleaning operations in seed merchants' warehouses.

FUSARIUM ROOT ROTS and WILTS (Fusarium spp.). These diseases were present in many crops, especially in old land, but no reports of serious losses were received.

RHIZOCTONIA ROOT ROT (Rhizoctonia solani). Several records during the year.

SCLEROTINIA ROT (Sclerotinia sclerotiorum). This disease was much less in evidence during the autumn and early winter months of 1948 than in the corresponding period in 1947 when heavy losses were recorded in beans consigned to the Sydney Municipal Markets from the Central and North Coast. There was one record of the disease in beans grown for seed on the South Coast.

ROOT KNOT (Heterodera marioni). Several records from coastal areas.

STEM EELWORM (Ditylenchus dipsaci). Inspections of bean crops grown on the four farms at Matcham (Central Coast) where the disease had occurred several years ago again failed to reveal the presence of the disease.

RUST (Uromyces phaseoli typica). Several records on crops of the variety Epicure.

SCLEROTIUM ROT (Sclerotium rolfsii). Two records during the year - one from the Sydney Metropolitan Area and the other from the South Coast.

PYTHIUM STEM ROT and WILT (Pythium aphanidermatum) was again recorded from the Murrumbidgee Irrigation Areas.

LEAF SPOT (? Phyllosticta sp.). A leaf spotting condition with which a species of Phyllostica was associated was recorded from Glenorie (Central Coast).

LEAF SPOT (? Ascochyta sp.). A leaf spotting condition with which a species of Ascochyta was associated, was recorded from Mangrove Mountain (Central Coast).

D.D.T. INJURY. Stunting of the plants with leaf scorch and necrosis of the stem tissue just above ground level, was recorded in an experimental plot of beans at Hawkesbury Agricultural College following an application of D.D.T. spray. It is thought that the injury was caused by some constituent in the carrier of the D.D.T., which was a paste or "mayonnaise" preparation, as injury was not recorded on replicate plots where the D.D.T. spray was prepared from an organic solvent.

## BROAD BEANS

SPOTTED WILT (virus). Several records.

CHOCOLATE SPOT (Botrytis cinerea). One record from Quirindi (North Western Slopes).

ROOT ROT. Several records. Species of both Fusarium and Rhizoctonia were found associated.

RUST (Uromyces fabae). Recorded from the Sydney Metropolitan Area.

## NAVY (FIELD) BEANS

AMERICAN COMMON BLIGHT (Xanthomonas phaseoli) was again the most important disease of navy beans on the Northern Tablelands. All crops in this area were affected. Progress was made during the year in building up supplies of seed free from this disease. About 100 bushels of Small White seed and lesser quantities of other varieties apparently free from disease were

harvested from crops planted on the South Coast and Murrumbidgee Irrigation Areas.

RUST (Uromyces phaseoli typica) was recorded on field beans grown in experimental plots at Hawkesbury Agricultural College. Most of the Small White (or Little Navy) types were free from rust but some strains were lightly affected.

## BEET and SILVER BEET

CERCOSPORA LEAF SPOT (Cercospora beticola) was again of common occurrence in both silver beet and table beet crops.

DAMPING OFF and WILT (Aphanomyces sp.) recorded from the Sydney Metropolitan Area on table beet.

ROOT KNOT (Heterodera marioni). Several records.

MOSAIC (virus). Recorded on silver beet from the Metropolitan Area. Infection of the order of 50 per cent and over was reported in some commercial crops. Growers at Mascot (Metropolitan Area) believe that there is some association with source of seed, i.e. that disease is seed-borne. This theory has not been further investigated.

## CAPE GOOSEBERRY

No records.

## CARROT

CARROT VIRUS. Several records from the Central Coast area, infection in most cases ranging from 50 per cent to 100 per cent.

ROOT KNOT (Heterodera marioni). Several records.

SCLEROTINIA ROT (Sclerotinia sclerotiorum). One record from the Metropolitan Area.

## CELERY

LATE BLIGHT (Septoria apii-graveolentis). Several records.

ROOT KNOT (Heterodera marioni). One record from Leeton (Murrumbidgee Irrigation Area).

## CRUCIFERS

BLACK ROT (Xanthomonas campestris). Several records on both cauliflower and cabbage but no reports of any serious losses.

WHIPTAIL (Non-parasitic). Surveys of cauliflower crops in the Central Coast area in the autumn of 1948 showed that the disease occurred mainly in the Windsor and Richmond (outer Metropolitan) districts and in the south-western section of the Metropolitan area. Very satisfactory results in controlling whiptail have been secured by the application of sodium molybdate or ammonium molybdate in the form of an aqueous solution either to the seed bed or to the plants in the field.

RING SPOT (Mycosphaerella brassicicola) was responsible for serious leaf spotting of cabbages in the Moss Vale-Robertson district (Southern Tablelands). The extremely wet summer was apparently responsible for this disease being of more importance than usual.

SCLEROTINIA ROT (Sclerotinia sclerotiorum). Recorded on cabbage and cauliflower in the Metropolitan Area.

DAMPING OFF and WIRE STEM (Rhizoctonia solani). Several records on cauliflower, cabbage and brussels sprouts seedlings from various parts of the State, the disease being of common occurrence during the late summer and early autumn months of 1948.

CLUB ROOT (Plasmodiophora brassicae). One record on cauliflower from the Metropolitan Area.

DOWNY MILDEW (Peronospora parasitica) was of common occurrence on cabbage and cauliflower crops. In some cases some stunting of seedlings in the seed bed was observed but field damage was almost negligible.

ALTERNARIA LEAF SPOTS (Alternaria brassicae and A.Herculea). The leaf spot disease caused by A.brassicae was recorded in several cauliflower crops. In one crop at Windsor (Central Coast) appreciable leaf damage was observed. The disease also occurred on cauliflower curds. The grey leaf spot disease caused by A.herculea was recorded for the first time in New South Wales, although it is believed that it has been here for many years. On the crop on which the disease was observed (a cauliflower crop in the Metropolitan Area) the disease was responsible for only a small amount of leaf spotting of almost negligible economic importance.

MOSAIC (? virus). A mottling thought to be of virus origin was observed in both cabbage and cauliflower crops in the Metropolitan Area. The incidence of the disease was low in all cases.

PEPPERY LEAF SPOT (Pseudomonas maculicola). One record on cauliflower from Bathurst (Central Tableland).

STUNTING and WILT (Fusarium sp. associated). Specimens of cabbage showing wilting, stunting and

yellowing were submitted from the Robertson district (Southern Tablelands). A species of Fusarium was isolated from roots of affected plants but infection tests failed to establish pathogenicity of the fungus.

PURPLE COLOURATION OF CURD. A condition in which the curds of cauliflowers were of deep purple colour was recorded in the Sydney Metropolitan Area. The grower had applied relatively large amounts of a proprietary minor element mixture and it is thought that this was the cause of the abnormal colour.

FROST INJURY (non-parasitic). Recorded on cabbages from Bathurst (Central Tablelands) and on cauliflower from the Metropolitan Area.

## CUCURBITS

POWDERY MILDEW (Erysiphe cichoracearum). As usual, this disease was of widespread occurrence on pumpkin, marrow, squash, rock-melon and cucumber crops.

DOWNY MILDEW (Peronoplasmopara cubensis). Extremely wet conditions during the summer months resulted in widespread and severe infection of cucumber and rock-melon crops.

FUSARIUM WILT (Fusarium niveum) of watermelons. One record from Leeton (Murrumbidgee Irrigation Areas).

D.D.T. BURN (non-parasitic). Reports by officers of the Entomological Branch of this Department indicated that all cucurbits are liable to leaf burn from the application of D.D.T. sprays and dusts.

## EGG PLANT

LEAF SPOT (Ascochyta lycopersici) caused considerable damage to leaves in a small plot in the Metropolitan Area.

BIG BUD (virus) was observed on one plant at Pennant Hills (Metropolitan Area).

## LETTUCE

SPOTTED WILT (virus). As usual this disease was prevalent in the Metropolitan Area. The disease appeared to be of somewhat less importance than during the preceding year.

BACTERIAL SOFT ROT. There were several records of a bacterial soft rot in the Metropolitan Area. In some cases it appeared to follow tip burn (non-parasitic) whilst in other cases it occurred after spotted wilt (virus).

DOWNY MILDEW (Bremia lactucae) was again common and widespread but in most cases infection was confined to the outer leaves.

SCLEROTINIA ROT (Sclerotinia sclerotiorum). Two records during the past year.

SEPTORIA SPOT (Septoria lactucae). Four records of this disease during the past year, three from the Metropolitan Area and the other from Moss Vale (Southern Tablelands).

BIG VEIN (? virus). Recorded during the past year from three commercial crops in the Metropolitan Area. The disease has not been identified definitely as big vein but it was of interest to find on one farm that the disease had been occurring repeatedly on the same part of the farm for several seasons. This observation is in agreement with the fact that the disease has been shown to be soil transmitted in the United States.

YELLOWING and STUNTING (non-parasitic). One case of severe stunting and yellowing was observed in the Metropolitan Area, associated with very acid soil (pH 4.4). Cauliflowers nearby were affected with whiptail and it is a possibility that a molybdenum deficiency was concerned in the case of the lettuce.

## MUSHROOM

No parasitic diseases were recorded.

WHITE GILL or FLOCK. A condition referred to by growers as "white gill" and which appears to be identical with that known in the United States as "flock" was prevalent in mushroom beds in the late winter and spring months of 1947, especially in outdoor ridge beds in the Riverstone-Windsor district (outer Metropolitan). In view of the possibility that the condition was associated with the strain of white mushroom used here, fresh cultures were imported from the United States.

## ONION

DOWNY MILDEW (Peronospora destructor). This disease was recorded during the spring months of 1947 from the Metropolitan Area, the Central North Coast and the Central Tablelands. Infection appeared to be general throughout the Sydney Metropolitan Area.

BLOAT (Ditylenchus dipsaci). This disease was recorded for the first time in New South Wales during the past year. The disease was found on three farms in the Maitland (Central Coast) district and in one crop of 3½ acres it was estimated that loss due to this disease would amount to 80 per cent. It is of interest to note that this disease was recorded over 50 years ago in Victoria where it has been reported to be of wide-spread occurrence in some of the main onion growing areas.

WHITE ROT (Sclerotium cepivorum). Two records during the year - one from Goulburn (Southern Tablelands) and the other from Gosford (Central Coast).

## PARSLEY

SEPTORIA LEAF SPOT (Septoria petroselini). One record from the Metropolitan Area.

## PARSNIP

ROOT KNOT (Heterodera marioni) was recorded from the Metropolitan Area.

## PEAS

POD and LEAF SPOT DISEASES (Mycosphaerella pinodes and Ascochyta pisi) and ASCOCHYTA FOOT ROT (Ascochyta pinodella). Unusually wet weather favoured the development of these diseases in many areas during the past season. A number of Tableland crops were affected, especially on the Central Tablelands. Mycosphaerella was also recorded from Leeton (Murrumbidgee Irrigation Areas) and from the Metropolitan Area. Foot rot was recorded from the Sydney Metropolitan Area and the South Coast. Leaf Spot was also recorded from Gosford (Central Coast) district.

POWDERY MILDEW (Erysiphe polygoni). There were a number of records of this disease from the Metropolitan Area and one from the South Coast.

FUSARIUM WILT and FOOT ROT (Fusarium spp.) was recorded from the South Coast, the Gosford (Central Coast) area and from Kurrajong (Central Tablelands).

BACTERIAL BLIGHT (Pseudomonas pisi). There were a number of records from the Central Tablelands and one record from Leeton (Murrumbidgee Irrigation Areas.).

DOWNY MILDEW (Peronospora viciae). Recorded from the Metropolitan Area, the Murrumbidgee Irrigation Areas and from Gosford (Central Coast).

SEPTORIA SPOT (Septoria pisi) was recorded from Burragorang (Central Coast) and Adaminaby (Southern Tablelands).

CLADOSPORIUM BLIGHT (Cladosporium pisicolum). One record from Bega (South Coast) and one record from the outer Metropolitan Area.

BIG BUD (?virus). A condition suggestive of infection with the tomato big bud virus was recorded for the first time in New South Wales from Cattai, near Windsor (Central Coast).

MOTTLE LEAF (?virus). Two records from the Metropolitan Area.

## POTATO

LATE BLIGHT (Phytophthora infestans) caused severe damage in both coastal and Tableland crops this season. Outbreaks in maincrop potato areas on the Central Tablelands reached epiphytotic proportions especially in the Oberon and Orange areas. It attacked early planted crops of all types regardless of the origin of the seed. Crops in the New England district were also attacked. Damage caused to coastal crops was widespread and severe - from Moruya on the South Coast to the Bellingen-Dorrigo area on the North Coast. The disease also caused losses in many crops in the Metropolitan Area.

EARLY BLIGHT (Alternaria solani). This disease also contributed to the general decrease in yield in most potato districts this season. It was recorded from the New England district and the Central Tablelands. In many cases in the Oberon and Orange districts of the Central Tablelands, attacks were quite severe.

LEAF ROLL (virus). Out of 322 crops examined for certification, 52 (16 per cent) were rejected because of this disease. Sebago seed from Canberra (Southern Tableland) which had been produced under irrigation, yielded many leaf roll affected plants when grown in drier areas. A crop from certified Sebago seed grown at Guyra (Northern Tablelands) showed approximately 80 per cent leaf roll infection. The disease was also recorded from the Metropolitan Area.

SPOTTED WILT (virus). Only 2 crops out of 322 were rejected because of this disease on the Tableland areas. This is in marked contrast to the previous year when up to 96 per cent of crops in some Tableland areas were rejected for spotted wilt. The disease was also recorded on a number of crops in the Metropolitan Area and from Maitland (Central Coast).

BLACK LEG (Bacterium phytophthorum) was recorded from the Tableland potato growing areas. Sebago crops in the Batlow area grown from Victorian seed gave a number of plants affected with this disease.

COMMON SCAB (Actinomyces scabies) and RHIZOCTONIA DISEASE (Rhizoctonia solani) were again widespread.

FUSARIUM WILTS and TUBER ROTS (Fusarium spp.) were recorded from Orange (Central Tablelands), Lambton (Central Coast) and the Metropolitan Area.

VERTICILLIUM WILT (Verticillium albo-atrum). There was one record from the Central Tablelands.

SILVER SCURF (Spondylocladium atrovirens) was recorded once from Grafton (North Coast).

ELLWORM (Heterodera marioni) was recorded in one crop on the Central Tablelands.

TIPBURN (non-parasitic). One case was recorded from the Orange district (Central Tablelands).

SWELLING and RUPTURE OF LENTICELS (non-parasitic). This condition due to improper water relations, was recorded from Tumblong (Southern Tablelands) and from the Metropolitan Area.

## RHUBARB

DOWNY MILDEW (Peronospora jaapiana). Several records.

PHYLLOSTICTA LEAF SPOT (Phyllosticta straminella). One record from Molong (Central Tablelands).

RUST (Puccinia rubella). One record from the Metropolitan Area.

## SWEET POTATO

SURFACE ROT (Fusarium oxysporum). One record on sweet potatoes from the Municipal Markets.

## TOMATO

SPOTTED WILT (virus). Spotted wilt continues to be the most serious disease of tomatoes in this State, its incidence being greatest in the environment of more densely populated areas. Few early outdoor crops in these districts were commercially successful. Losses ranged from 15 per cent to 100 per cent.

Plant replacement of the order of 5 per cent was necessary in glasshouses in which the incidence of disease is largely confined to the early periods of growth.

Again this year there was a tendency for infection to carry over to a greater extent than normal into the post December growing season. A wide range of host symptoms was noted. Some controlling effect was noted in crops sprayed with 0.1 per cent D.D.T. emulsion at weekly, and more frequent intervals.

EARLY BLIGHT (Alternaria solani) was prevalent in all crops throughout the State from November onwards. Stem lesions were particularly prevalent in seed beds and girdling at ground level was also common. Defoliation of lower leaves occurred in many crops. Calyx infection followed by attack on ripening fruit caused from 10 to 20 per cent losses. One characteristic of the disease this season was the smallness and high number of lesions on both stems and leaves.

FUSARIUM WILT (Fusarium oxysporum f. lycopersici) caused from 5 to 10 per cent losses in glasshouse crops despite the practice of steam

"sterilization" of the soil by spiked harrows. Losses in outdoor crops occurred in all districts, though they were of lesser magnitude, particularly in the variety Grosse Lisse, which exhibits field resistance in this State.

Outdoor infection was recorded twice during the relatively cold month of May, and again, in one instance, in June.

BACTERIAL CANKER (Corynebacterium michiganense). Despite showery weather no "birds-eye" symptoms of this disease were reported during the year. Affected plants were received from the Far West, the South Coast, the Murrumbidgee Irrigation Areas, the North Coast and the Metropolitan Area. The number of crops infected, however, was restricted to one or two farms in each case. The variety Grosse Lisse which continues to increase in popularity, was concerned in two of the outbreaks. Seed treatment with 0.6 per cent acetic acid is apparently holding the disease in check.

BACTERIAL SPOT (Xanthomonas vesicatoria). Caused leaf lesions and disfigured fruit extensively in affected crops. The disease was recorded on the North Coast, Central Tablelands and Central Coast.

Rouge de Marmande is the variety most commonly infected and it seems probable that infected seed is responsible for the continued prevalence of the disease. Red Cloud, which is being grown a little more widely, was affected on virgin land on the North Coast.

In one diseased late crop in the Metropolitan Area, the severity of the disease decreased as colder weather advanced.

LEAF MOULD (Cladosporium fulvum) was of importance only in glasshouse crops where lesions were noted to be at least two-thirds up the plants in all houses inspected in September.

Outdoor crops growing in the immediate proximity of glasshouses were usually 100 per cent infected, though damage was not great. Occasional plants only were attacked in other areas, and in most cases crops were free of the disease.

ROOT KNOT (Heterodera marioni) was prevalent, without causing serious damage, in glasshouses in sandy districts. Late planting helps largely to keep the disease in check. During November-December and January severe infections were recorded from the North West Slopes, Central Tablelands and South Western Slopes, as well as from sandy soils in the Sydney and Newcastle Metropolitan Areas. The disease, though common, was not of major importance.

SEPTORIA LEAF SPOT (Septoria lycopersici) was more common in inland districts than on the coast, though specimens were obtained from most areas throughout the State. In individual cases defoliation was severe, but in general, the disease was of little importance.

BLOSSOM DROP (non-parasitic). A variety of factors was responsible for blossom drop which was recorded in the North West Slopes, the North Coast and the Metropolitan Area. In early crops of late-early plantings the bottom hand of fruit often failed to set though higher flowers developed successfully. The condition was more common than usual last season.

MAGNESIUM DEFICIENCY. Few examples of magnesium deficiency were seen during the year.

VERTICILLIUM WILT (Verticillium dahliae). Only one record of this disease was made during the year. This was from a glasshouse in the Metropolitan Area.

FRUIT ROTS. Phytophthora infestans. One record from the North Coast. Phoma destructiva. One record each from the North Coast, the Central Tablelands and the Metropolitan Area. Alternaria solani caused from 10 to 20 per cent loss in late maturing fruit. It was frequently associated with non-parasitic fungi and bacteria in fruit primarily affected by star-crack. No rot due to Alternaria solani was obtained in the only two crops of "Prosperity" examined, although foliage and stem lesions were relatively severe. A considerable number of fruits with markings superficially resembling lesions of Alternaria tomato (unrecorded in this State) were examined, particularly from autumn crops. No specific fungi were consistently isolated and spray burn (? D.D.T. - colloidal sulphur) is suspected.

RHIZOCTONIA ROOT ROT (Rhizoctonia solani) was less prevalent than during last season. There was one record only from the North Coast, and one only from the South Coast.

BLOSSOM END ROT (Non-parasitic). Despite weather conditions which were cooler than normal, excess water was probably responsible for mild outbreaks of blossom end rot on the North and Central Coast. On the Murrumbidgee Irrigation Areas San Marzano exhibited 1 to 5 per cent internal blossom end rot, largely as thin cork layers on the distal half of the placenta. Saprophytic species of Alternaria were sometimes associated with the internal breakdown.

MOSAIC (virus). Mosaic was widely distributed in glasshouses in the Metropolitan Area, though its effect on yields was negligible. Some damage was caused in one outdoor crop in the Central Tablelands.

BIG BUD (virus). Possibly due to the lush growth of weeds etc. the incidence of "big bud" in inland areas was particularly high. Losses of up to 25 per cent were common on the Central Tablelands and South Western Slopes. Incidence was also severe (2 to 25 per cent) in crops in the Murrumbidgee Irrigation Areas.

Little difference was noted in incidence rate on tomatoes in coastal districts, although aster plants were unusually heavily infected on the coast.

SUNSCALD (non-parasitic). More fruit than usual was lost due to sunscald throughout the State. The soft growth, due to the mild, moist season, probably pre-disposed the fruit to scald during the occasional occurrence of typical hot weather. On some occasions foliage was also affected.

FERNLEAF (virus). This disease occurred to a greater extent in inland areas and to a considerably greater degree in coastal districts where infection rates of up to 10 per cent as compared with a normal incidence of less than 1 per cent were observed in certain crops. Infection also took place later into the season.

LATE BLIGHT (Phytophthora infestans). Despite seasonal conditions which initiated severe infections in potatoes, only one case of infection in tomato was recorded.

COLLAR ROT (Phytophthora cryptogea) caused 1 per cent loss in a glasshouse at Mona Vale (Metropolitan Area).

CATFACE (non-parasitic) was observed in consignments of tomatoes from the North Coast.

BACTERIAL SPECK (Bacterium tomato) caused extensive leaf spotting in a seedling propagation glasshouse in the Murrumbidgee Irrigation Area. Symptoms disappeared to a large extent after the plants were transferred to the field, but individual cases of specks on fruit were observed.

## MISCELLANEOUS PLANTS.

### ASTROTRICHA FLOCCOSA

LEAF SPOT (Cercospora sp.) was recorded for the first time from Kuringai Chase (Metropolitan Area).

### BAECKIA BREVIFOLIA

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on this host from Kuringai Chase (Metropolitan Area).

### BLACKBERRY (RUBUS FRUCTICOSUS)

ANTHRACNOSE (Elsinoe veneta) was recorded on blackberries in the Batlow (South Western Slopes), Robertson (South Coast) and Metropolitan districts.

## BURR, BATHURST (XANTHIUM SPINOSUM)

STEM CANKER (? Colletotrichum sp.) was responsible for heavy mortality of plants in the Merriwa (Central Tablelands), Inverell (Northern Tableland) and Gunnedah (North Western Slopes) districts. At Merriwa almost 100 per cent of the plants over 2,000 acres of thickly infested land were killed. At Inverell about 20 per cent of the plants were killed.

## BURR, GALVANISED (BASSIA BIRCHII)

RUST (Puccinia bassiae) was general throughout the Western Division, both aecial and teleutospore stages developing. In some localities it caused considerable mortality, but it is not likely to prove an effective control of this weed since the seasonal conditions, which favoured the development of the disease in epiphytotic proportions, occur only rarely.

## BURR WEED, YELLOW (AMSINCKIA HISPIDA)

STEM ROT (Sclerotinia sclerotiorum) was recorded for the first time on this host in New South Wales from Leeton (Murrumbidgee Irrigation Areas), causing practically 100 per cent infection.

## CROWFOOT, BLUE (ERODIUM CYGNORUM)

LEAF GALL (Synchytrium papillatum) was common on this host in the Wagga (South Western Slopes) district during spring 1947.

## DILLWYNIA ERICIFOLIA

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on this host from Kuringai Chase (Metropolitan Area).

## DOCK (RUMEX OBTUSIFOLIUS)

SMUT (Ustilago (?) lagerheimii) was recorded for the first time on this host in New South Wales from Green Valley (outer Metropolitan).

LEAF SPOT (Ovularia sp.) was prevalent during spring and early summer.

## DUCK WEED (HYDROCOTYLE SP.)

SCLEROTINIA ROT (Sclerotinia minor) was recorded from Wagga (South Western Slopes).

EPACRIS MICROPHYLLA and E.PULCHELLA

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on these hosts from Kuringai Chase (Metropolitan Area).

ERIOSTEMON CROWEI

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on this host from Kuringai Chase (Metropolitan Area).

GRAPE, WILD (VITIS HYPOGLAUCA)

DOWNY MILDEW (Plasmopara viticola) was recorded for the first time on this host from Kuringai Chase (Metropolitan Area), causing considerable damage to young foliage following prolonged cool wet weather in early spring.

KENNEDYA RUBICUNDA

LEAF SPOT (Cercospora Kennedyae) was recorded for the first time in New South Wales on this host from Lindfield and Palm Beach (Metropolitan Area).

LEUCOPOGON MICROPHYLLUS

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on this host from Kuringai Chase (Metropolitan Area).

MALVA

RUST (Puccinia malvacearum) was widespread.

MICRANTHIUM ERICOIDES

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on this host from Palm Beach (Metropolitan Area).

MUSTARD, WILD

LEAF and STEM SPOT (Alternaria sp.) was observed causing heavy infection in the Wagga district (South Western Slopes) following cool damp spring weather.

PHYLLOTA PHYLICOIDES

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on this host from French's Forest (Metropolitan Area).

PULTENAEA ELLIPTICA

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on this host from Palm Beach (Metropolitan Area).

SIDA (SIDA RHOMBIFOLIA)

ROOT KNOT (Heterodera marioni) was recorded on this host from the Metropolitan Area.

SPRENGELIA INCARNATA

ROOT ROT (Phytophthora cinnamomi) was recorded on this host for the first time from Kuringai Chase (Metropolitan Area).

STYPHELIA LONGIFLORA

ROOT ROT (Phytophthora cinnamomi) was recorded on this host for the first time from Kuringai Chase (Metropolitan Area).

THISTLE, MILK (SONCHUS OLERACEUS)

GREENING (Big Bud virus) was recorded for the first time on this host from Leeton (Murrumbidgee Irrigation Areas).

LEAF SPOTS (Alternaria sp. and Septoria sp.) were very prevalent during spring and early summer.

WIRE WEED (POLYGONUM AVICULARE)

LEAF SPOT (Cercospora avicularis) DOWNY MILDEW (Peronospora polygoni) and RUST (Uromyces polygoni) were recorded on this host from a number of Metropolitan districts.